Town of Natick, MA

Cochituate Rail Trail Conceptual Design Study

Fay, Spofford & Thorndike
ENGINEERS FST Since 1914

DRAFT November 2009

Executive Summary

TO BE COMPLETED FOLLOWING PUBLIC INFORMATION MEETING

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1 Introduction

1.1 Project Area Description

The proposed Cochituate Rail Trail (CRT) follows the four (4) mile "Saxonville Branch" of the former Boston & Albany Railroad.from School Street in Framingham to the Natick Center MBTA Commuter Rail Train Station.

The Natick section of the CRT extends along a 2.4-mile segment of the CSX Saxonville Branch right-of-way as shown on the locus map on the following page. The project begins at the Framingham town line at Route 30, runs south along Cochituate State Park and the western shore of Lake Cochituate, crosses Route 9 on an elevated railroad bridge, runs south through several residential areas, and connects to Natick Center. The project also includes the 0.25-mile spur known as the "Wonder Bread Spur," which connects the CRT to the Natick Collection and other trails.

1.2 Connections

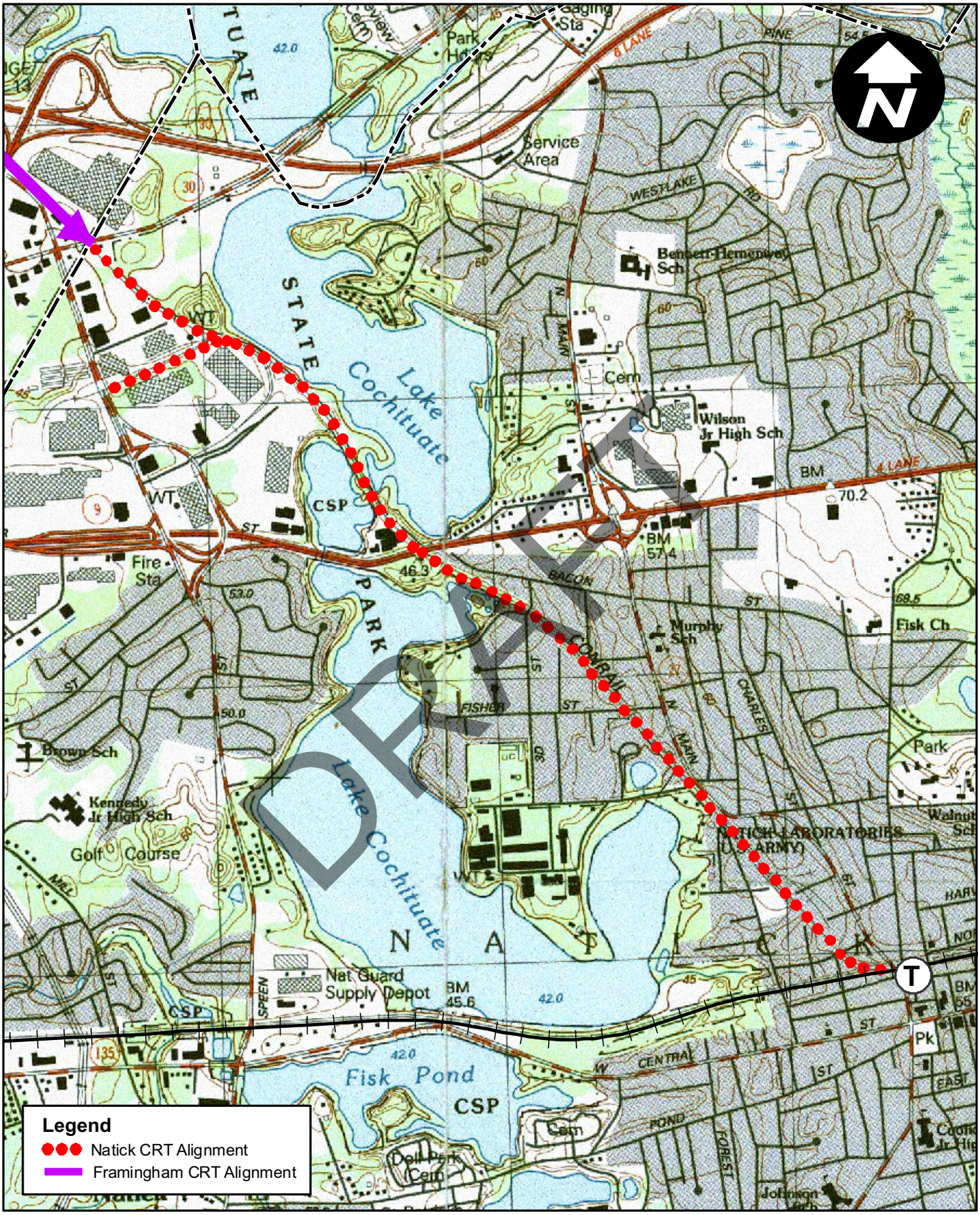
The CRT will serve as an alternative transportation facility for local travel to employment districts, residential areas, and other destinations within Natick and to adjacent communities. The trail will also serve a recreational need by providing a universally accessible trail for users of all ages and abilities. The proposed CRT will provide improved bicycle and pedestrian access to the following destinations:

- Cochituate State Park
- Natick Collection Paths
- Camp Arrowhead
- Navy Yard Field
- Anniballi Park (Pegan Cove Park)
- MBTA Commuter Rail Station
- Natick Center

Detailed base mapping of the project corridor is included in the Appendix A.

1.3 Ownership

As documented in the Saxonville Branch Right-of-Way Reconnaissance Study prepared by CTPS in January 2000, the Framingham/Worcester commuter rail line was chartered by the Massachusetts legislature in 1831 as the Boston & Worcester Railroad (B&W) and was owned and operated by the B&W. The line from Boston to Worcester opened in several stages between April 1834 and July 1835, reaching Natick in September 1834. The railroad opened the Saxonville Branch on July 6, 1846. The Branch was used to construct the dam for Lake Cochituate and serviced the textile mills of Saxonville. Through an 1867 merger, the newly created Boston & Albany Railroad (B&A) acquired the line. Eventually, through a series of leases and mergers, the Saxonville Branch became the property of Conrail (Consolidated Rail Corporation).



Natick and Framingham USGS Quads

Scale: 0 750 1,500 Feet

Figure 1: Project Locus Map
Cochituate Rail Trail (CRT)
Natick, Massachusetts

In 1997, the other two major eastern freight railroads, CSX Corporation and Norfolk Southern Corporation, agreed to jointly acquire Conrail. The former B&A lines in New England, included the southern section of the Saxonville Branch, were acquired by CSX on June 1, 1999.

On July 7, 2006, CSX filed an abandonment docket with the Surface Transportation Board (STB) and suspended freight service along the corridor. In the Summer of 2007, CSX salvaged the tracks and ties. Currently, in 2009, the Town of Natick is negotiating a trail use/rail banking agreement with CSX for the railroad right-of-way.

1.4 Study Purpose

With the help of the Natick Collection mitigation funds, the Town hired the consulting firm of Fay, Spofford & Thorndike (FST) to prepare this Conceptual Design Study to determine the feasibility of developing a rail trail (or shared use trail) along the Natick portion of the railroad right of way.

The primary goals of this study are to:

- Assess existing conditions along the corridor
- Evaluate and document potential environmental impacts
- Discuss key design and constructability related issues
- Develop a conceptual design and construction cost estimates

Ultimately this study will assist Town officials and residents to determine their willingness, readiness and fiscal ability to proceed with the rail trail project.

2 Environmental Resources

The purpose of this section is to document the types of environmental resource areas along the project corridor and identify potential environmental issues early in the rail trail development process. LEC Environmental Consultants, Inc. (LEC) assisted FST in the preparation of this section.

A discussion of the environmental resources associated with the rail corridor and regulatory information pertaining to these resources is presented in the following sections.

Figure X: View of Lake Cochituate From Trail Corridor

Development of this corridor into a rail trail will require measures to avoid and minimize impacts to adjacent environmental resources. Site-specific designs aimed at the protection of these resources will be needed to enable a rail trail to coexist within this diverse resource base. This corridor provides an excellent opportunity to educate its users about the importance of natural resources conservation.

2.1 Wetland Resources

A number of Wetland Resource Areas protectable under the Federal Clean Water Act, Massachusetts Wetlands Protection, and the Natick Wetlands Protection Bylaw are likely present along the length of the proposed rail trail.

These Wetland Resource Areas include:

- Bordering Vegetated Wetlands (BVW) and Isolated Vegetated Wetlands (IVW)
- Bank associated with Intermittent Streams
- Land Under Waterbodies (LUW) associated with Lake Cochituate
- Bordering Land Subject to Flooding (BLSF), otherwise known as the 100-year floodplain
- Potential Vernal Pools

Based on our review of available MassGIS mapping, USGS mapping, and other sources, the following provides a description of each resource area and typical locations along the trail where such resources occur.

Bordering Vegetated Wetlands are freshwater wet meadows, marshes, swamps, and bogs that border on rivers, streams, ponds, and lakes. BVW along the trail is associated with Lake Cochituate, which occurs north and south of the proposed trail. Additional scattered wetland systems are also located along the trail. BVW appears to occur along 1/3 of the proposed trail, with the majority occurring along the southwesterly boundary of Lake Cochituate. In addition to the BVW, there may be pockets of Isolated Vegetated

Wetlands (IVW) along the proposed trail. IVWs provide similar habitat to BVWs, but do not border other resource areas.

Bank abuts and typically confines water bodies such as intermittent and perennial streams, ponds, and lakes. Bank along the Cochituate Rail Trail is primarily associated with Lake Cochituate. Additional areas of Bank associated with intermittent stream channels occur along the length of the trail corridor. Based on our review of the USGS Topographic Map and USGS StreamStats Program, all of the streams located within 200 feet of the trail corridor are considered 'intermittent' streams. None of the streams meet the 'perennial' stream criteria outlined in the Wetlands Protection Act Regulations that would afford them the protection of Riverfront Area.

Figure X: Wetland Resource Area Located Between Fisher and Kansas Streets

Land Under Waterbodies and Waterways (LUW) is the land beneath rivers, streams, ponds or lakes. LUW associated with Lake Cochituate extends from the lower boundary of Bank.

Bordering Land Subject to Flooding (BLSF), is the portion of the 100-year floodplain that extends beyond the limits a Bordering Vegetated Wetland. As noted below, work within BLSF or the floodplain requires compensatory storage to ensure work will not cause flooding that will impact adjacent land owners or negatively impact other wetland resource areas. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the Town of Natick, BLSF (Zone A as it is depicted on the FEMA Maps) occurs in association with Lake Cochituate, and includes a portion of the trail corridor that bifurcates the northern and southern portions of the Lake.

Potential Vernal Pools According to the Mass GIS data layer for Vernal Pools [provided by the Natural Heritage and Endangered Species Program (NHESP)], two Potential Vernal Pools (PVP) are located along the trail corridor. One is located on the south side of the corridor, northeast of Lake Cochituate, while the other is located on the north side of the corridor, west of Lake Cochituate. Additional field work will be required to determine the exact location of the PVPs, and whether they meet the criteria for certification by NHESP.

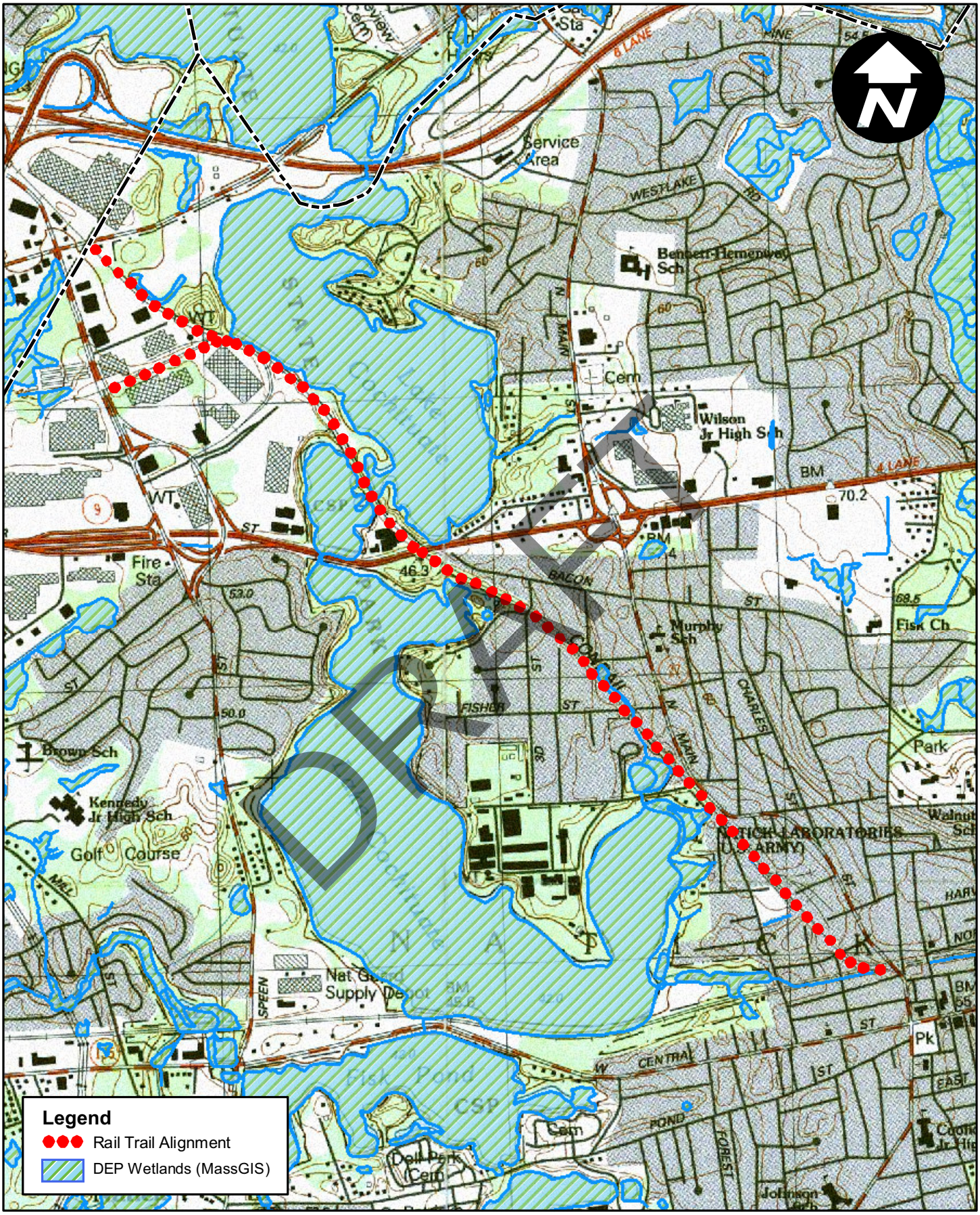
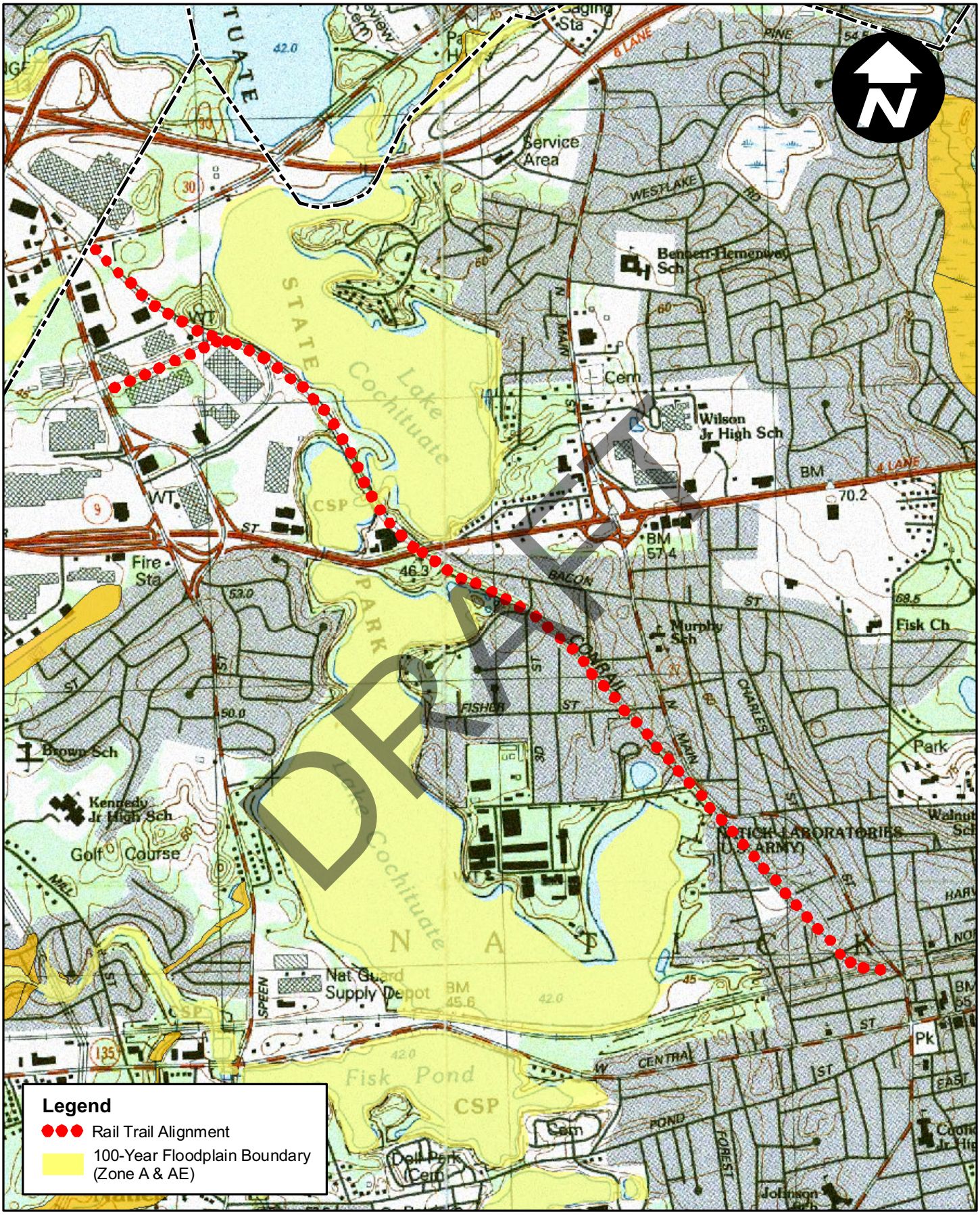


Figure X: Wetland Resources
Cochituate Rail Trail
Natick, Massachusetts



Natick and Framingham USGS Quads

Scale: 0 750 1,500 Feet

Figure X: Floodplain Boundaries

Cochituate Rail Trail
Natick, Massachusetts

2.1.1 Site Evaluation and Resource Area Determination

In addition to the above mapping and data review, LEC Environmental Consultants, Inc. (LEC) conducted a site evaluation along a portion of the trail corridor extending from Mechanic Street to the trail terminus at Natick Center. The purpose of this site evaluation was to determine whether any protectable wetland resource areas occur within this section of the trail corridor.

Figure X: Trail Corridor Looking South Towards Cochituate Street Overpass

Based on our observations, it appears that the removal of the railroad ties and ballast has altered the drainage patterns within the trail corridor extending from the Cochituate Street bridge to the trail terminus. Specifically, the topographically flat areas within the corridor near the bridge appear to retain standing water following precipitation events, as shown in Figures X and X. This stormwater discharges into a ditch within the trail corridor that extends southeasterly along a topographic slope. Near the trail terminus, the ditch discharges to a channel that flows westerly toward Lake Cochituate. While much of this area is devoid of vegetation (containing significant household trash and debris), scattered patches of colonizing wetland vegetation were observed within the topographically flat area near the Cochituate Street bridge and within the channel, including jewelweed (*Impatiens capensis*). LEC was unable to evaluate the soils within this area due to the compacted conditions, likely resulting from historic land alteration associated with the railroad.

Figure X: Trail Corridor Looking South From Cochituate Street Overpass

Due to these unique conditions, jurisdiction of this area under the pertinent statutes is marginal, and only the local Conservation Commission can legally determine jurisdiction. In order to determine whether this area is jurisdictional under the Federal, State, and Local Statutes referenced above, LEC recommends that that the project proponent file a Request for Determination of Applicability (RDA) with the Natick Conservation Commission. Alternatively, determining jurisdiction of this area could be established through filing an Abbreviated Notice of Resource Area Delineation (ANRAD) to establish the Wetland Resource Area boundaries associated with the entire trail corridor.

2.2 Rare Species

Based on the MA Natural Heritage Atlas [MA Natural Heritage & Endangered Species Program (NHESP); 13th Edition, Effective October 1, 2008] and related MassGIS

datalayers, the project corridor traverses both Priority Habitat of Rare Species (PH) and Estimated Habitats of Rare Wildlife (EH) polygons.

Based on the MA Natural Heritage Atlas [MA Natural Heritage & Endangered Species Program (NHESP); 13th Edition, Effective October 1, 2008] and related MassGIS datalayers, the project corridor is located within or proximate to the following Priority Habitat of Rare Species (PH) and Estimated Habitat of Rare Species (EH):

PH 200 / EH 95: This polygon is associated with Lake Cochituate and proximate wetland systems. The project corridor traverses the corridor from the Wonderbread Spur to a point approximately 1,100 feet south of the Route 9 bridge amd again between Fisher and Kansas Streets.

FST contacted the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (DFW-NHESP) regarding the known presence of any state-listed rare species along the trail corridor. The response letter is included on the following page. According to this letter, the listed species associated within this polygon is the Eastern Pondmussel (Ligumia nasuta), a species of Special Concern.

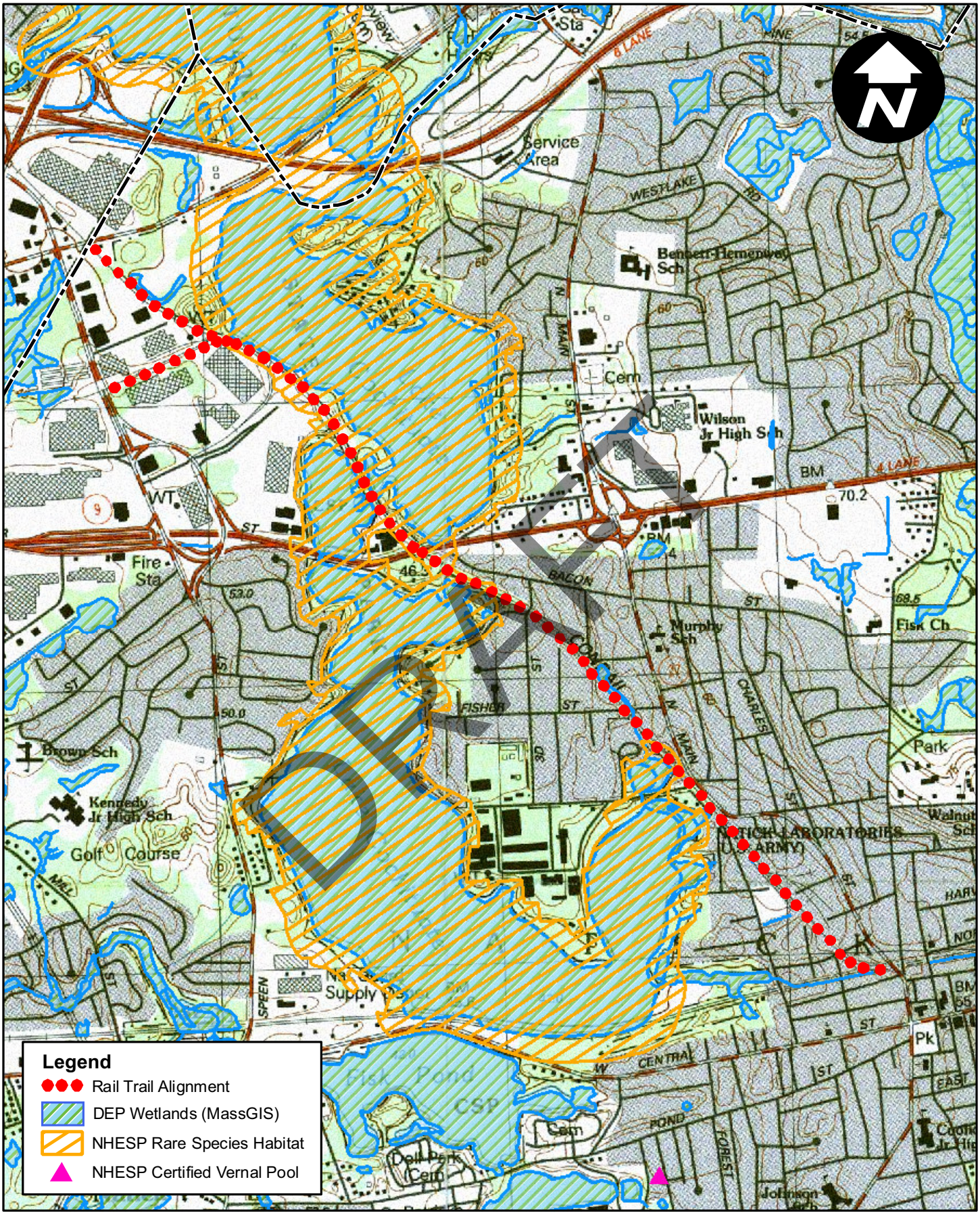
2.3 Stormwater Critical Areas

Stormwater discharges to critical areas must utilize certain stormwater management Best Management Practices (BMPs) approved for critical areas. Critical areas include Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies. These critical areas have the maximum practicable protection under the Massachusetts Stormwater Management Policy.

Along the project corridor, there are ORWs associated with potentially certifiable vernal pools as well as a DEP Wellhead Protection Area. The areas are described in more detail below and illustrated on Figure X.

Outstanding Resource Waters (ORWs) are afforded higher protection to maintain their existing uses and water quality. All certified vernal pools also constitute Class B ORWs. Therefore, as noted previously, additional field work will be required to determine if the Potential Vernal Pools (PVP) along the project corridor meet the criteria for certification by the MA Natural Heritage and Endangered Species Program (NHESP).

DEP Wellhead Protection Areas are important for protecting the recharge area around public water supply wells. Certain land uses may be either prohibited or restricted in approved Zone II Wellhead Protection Area (WPA). A Zone II is a wellhead protection area that has been determined by hydrogeologic modeling and approved by the Department of Environmental Protection's (DEP) Drinking Water Program. A Zone II is the area of an aquifer that contributes water to a well under the most severe pumping and recharge conditions. The land area located east of Lake Cochituate is within an approved Zone II WPA for the Town of Natick Springvale Municipal Water Supply Well Field (Springvale Well Field). The project corridor traverses the WPA from the stone arch culvert near Camp Arrowhead to Kansas Street.



Natick and Framingham USGS Quads

Scale: 0 750 1,500 Feet

Figure X: NHESP Priority & Estimated Rare Species Habitat

Cochituate Rail Trail
Natick, Massachusetts

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

November 19, 2009

John Hendrickson
Fay, Spofford & Thorndike
5 Burlington Woods
Burlington MA 01803

RE: Project Location: Rail Trail, CSX Saxonville Branch right-of-way
Town: NATICK
NHESP Tracking No.: 09-27465

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat 200* (PH 200) and *Estimated Habitat 95* (EH 95) as indicated in the *Massachusetts Natural Heritage Atlas* (13th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Ligumia nasuta	Eastern Pondmussel	Mussel	Special Concern

The species listed above is protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website (www.nhesp.org).

Please note that projects and activities located within Priority and/or Estimated Habitat **must** be reviewed by the NHESP for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

Wetlands Protection Act (WPA)

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the NHESP so that it is received at the same time as the local conservation commission. If the NHESP determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the NHESP to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

A streamlined joint MESA/WPA review process is available. When filing a Notice of Intent (NOI), the applicant may file concurrently under the MESA on the same NOI form and qualify for a 30-day streamlined joint review. For a copy of the revised NOI form, please visit the MA Department of Environmental Protection's website: http://www.mass.gov/dep/water/approvals/wpaform3.doc.

MA Endangered Species Act (MESA)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be sent to NHESP Regulatory Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). For a MESA filing checklist and additional information please see our website: www.nhesp.org ("Regulatory Review" tab).

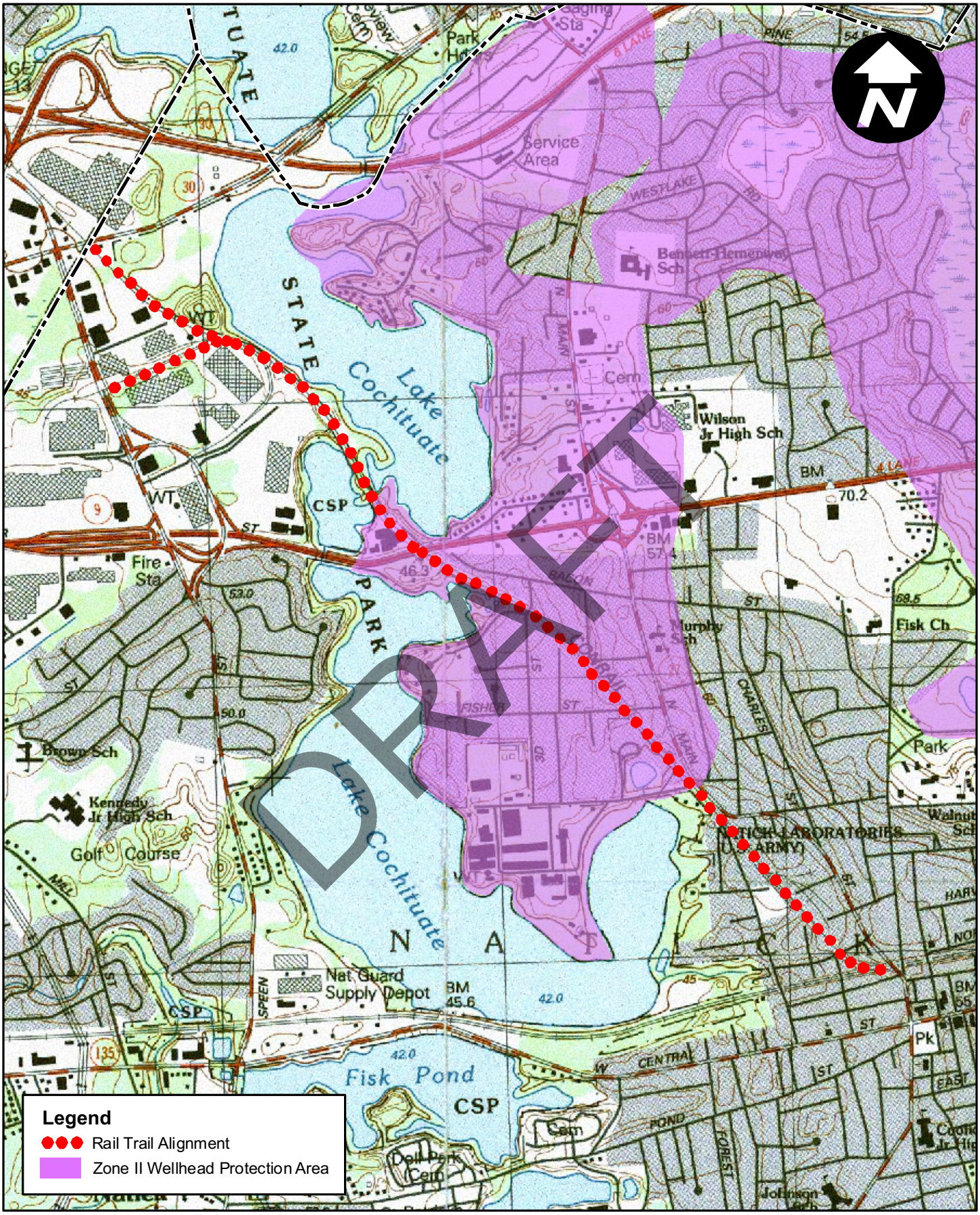
We recommend that rare species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to rare species and their habitats is likely to expedite endangered species regulatory review.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Emily Holt, Endangered Species Review Assistant, at (508) 389-6361.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director



Natick and Framingham USGS Quads

Scale: 0 750 1,500 Feet

Figure X: Stormwater Critical Areas

Cochituate Rail Trail
Natick, Massachusetts

2.4 Summary

TO BE COMPLETED

3 Environmental Permitting

As documented in the previous section, the project corridor parallels and traverses several Wetland Resource Areas. Accordingly, the project will require environmental permit applications to be filed in accordance with local, state and federal statutes and regulations.

Of particular interest is the area within the southeastern portion of the trail corridor discussed in Section 2.1.1 of this study. Should this area be determined to be a wetland resource area, the project could result in significant Bordering Vegetative Wetland (BVW) and/or Bank alteration, which would expand the permitting requirements outlined below.

The following is a list of the anticipated environmental permits.

- National Environmental Policy Act (NEPA)
- Massachusetts Environmental Policy Act (MEPA)
- Massachusetts Wetlands Protection Act (MGL. c. 131 s 40), its implementing *Regulations* (310 CMR 10.00), and Natick Wetlands Protection By-Law
- Massachusetts Endangered Species Act (MGL. c. 131A, MESA) and its implementing Regulations (321 CMR 10.00) [1]
- NPDES General Permit for Discharges from Construction Activities

The proposed rail trail will require permits and/or review with regulators to determine if a permit is required for all of these statutes and regulations.

3.1 National Environmental Policy Act (NEPA)

As most rail trail projects involve Federal funds (TEA-21), compliance with NEPA will be required. However, since rail trail construction infrequently results in significant impacts, these projects are classified as Categorical Exclusions (CEs). CEs are actions which meet the definition contained in 23 CFR 771.1177(a); that is, they are actions which individually or cumulatively do not involve significant social, economic or environmental impacts, and are therefore, categorically excluded from the requirement to prepare and Environmental Assessment (EA) or Environmental Impact Statement (EIS). The supporting information filed with the CE checklist should clearly establish that there is little or no potential for significant social, economic or environmental impact.

3.2 Massachusetts Environmental Policy Act (MEPA)

The MEPA office is part of the Executive Office of Energy and Environmental Affairs (EOEEA). The purpose of MEPA is to provide an opportunity early in project design for state regulatory agencies to comment on a proposed project prior to the filing of permits.

[1] The regulatory standards under the Massachusetts Endangered Species Act and Regulations do not specify thresholds that automatically require a permit; rather NHESP has established a Project Review process whereby a determination is made on project-by project-basis if a permit is required.

An Environmental Notification Form (ENF) or Environmental Impact Report (EIR) is required to be submitted to MEPA if:

- The project is subject to MEPA review [e.g. the project is undertaken by an Agency (of the Commonwealth)];
- Involves State Agency Financial Assistance or requires an Agency Action/Permit); and
- Environmental impacts or review thresholds as referenced in the MEPA regulations are exceeded.

The MEPA Regulations at 301 CMR 11.03 provide review thresholds to determine whether a project will require the filing of an ENF or an EIR. While it does not appear that this project would require the filing of an EIR, the potential for an ENF should be considered in light of the following review thresholds:

- Creation of 5 or more acres of impervious area [11.03 (1) (b) 2.]; This area translates to a 3.4 mile length for an 12-foot wide trail. The surface area quantity and whether it is considered impervious will vary depending upon the selected trail surface material and width, and whether the Town decides to pave or expand parking areas as part of the project.
- Taking of an endangered species or threatened species or species of special concern, provided that the Project site is two or more acres and includes an area mapped as a Priority Site of Rare Species Habitats and Exemplary Communities [11.03 (2) (b) 2.];
- Alteration of 5,000 square feet or more of bordering or isolated vegetated wetlands and/or alteration of ½ or more acres of any other wetlands [11.03 (3)(b) 1.d. and f.];

3.3 Massachusetts Wetlands Protection Act and the Natick Wetlands Protection Bylaw

Based on a preliminary review of the site and traversing portions of the rail trail bed, the majority of the proposed work will occur within the Buffer Zone to BVW and/or Bank, with portions occurring within BLSF, and perhaps within the BVW for the southeastern-most portion depending on the results of an RDA for this area. This work will require the filing of a Notice of Intent (NOI) Application with the Natick Conservation Commission for pre-construction review.

Bordering Vegetative Wetland (BVW): Should it be determined that BVW will be impacted as part of this project, an alternatives analysis must be conducted to avoid, minimize, and mitigate for wetland alteration (310 CMR 10.55). Such an alternatives analysis would likely include the use of an elevated boardwalk over the BVW to minimize BVW alteration. Additionally, the Wetlands Protection Act Regulations require that wetland replication be provided at a 1:1 ratio. The Natick Wetlands Protection Bylaw requires a 1.5:1.0 ratio of wetland replication. It is also likely that the Conservation Commission and/or DEP will require completion of a wildlife habitat evaluation in accordance with the Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands (March 2006). If the amount of BVW alteration exceeds 5,000 square feet, the proposed project would be required to meet the criteria to be deemed a limited project under 310 CMR 10-53 (3). This may be achieved by applying 310 CMR 10.53 (3) j.,

which includes "the construction and maintenance of catwalks, footbridges…provided, however, that such structures are constructed on pilings or posts so as to permit the reasonably unobstructed flowage of water and adequate light to maintain vegetation." As mitigation, for BVW alteration, adjacent areas could be improved by establishing a native plant community (in areas currently devoid of vegetation).

Bordering Land Subject to Flooding (BLSF): Cut and fill operations for trail construction within BLSF shall not cause any net increase in the surrounding natural flood elevation. No greater volume of fill shall be deposited on or within the floodplain than the volume that can be created by compensatory cutting immediately adjacent to the floodplain. Compensatory storage will be required for all flood storage volumes that will be lost, if any, as a result of the trail construction. Additionally, if greater than 5,000 square feet of BLSF is altered within the Buffer Zone to BVW or within the 10-year floodplain, then a wildlife habitat evaluation is also required for work within the BSLF looking at habitat criteria similar to that of the BVW.

Buffer Zone: In addition to the above provisions for BVW and BLSF alteration, the Natick Wetlands Protection Bylaw typically requires alteration setbacks for work within the Buffer Zone. Specifically, they require a 25-foot No Disturbance Zone, and a 40-foot No Structure Zone. That is, no work is allowed within 25 feet of a wetland boundary, and no structures are allowed within 40 feet of a wetland boundary. Additionally, the Bylaw requires a 100-foot No Disturbance Zone to Vernal Pools. Should the proposed trail project be located within these zones, and no alternative is available to re-locate the trail outside these Zones, the Commission may offer some latitude considering the previously developed nature of the project footprint.

3.4 Massachusetts Endangered Species Act (MESA)

At a minimum, Project Review with the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (DFW-NHESP) would be required in order for the NHESP to make a determination if the project will result in a "take" of any of the state-listed species associated with the project site. This review could be conducted through Simplified Review as part of the NOI Application or through a Project Review filing directly with DFW-NHESP). A "take", in reference to an animal, means to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, or to disrupt nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct. In reference to plants, a "take" means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Based on the listed-species for this site and extent of proposed work, it is not anticipated that the trail project will result in a "take" of any species. However, the project still needs to be reviewed under MESA for compliance with the state-listed rare species protection revisions of MESA (321 CMR 10.00) and/or the Massachusetts Wetlands Protection Act (310 CMR 10.00).

3.5 NPDES General Permit for Discharges from Construction Activities

Phase II of the National Pollutant Discharge Elimination System (NPDES) Stormwater program was published in the Federal Register on October 8, 1999. As outlined in Phase II, any construction activity that will disturb one or more acres and has the potential to have a discharge of stormwater to a water of the United States must either have a permit or have qualified for a waiver. Construction activity refers to actual earth disturbing construction activities and those activities supporting the construction project

such as construction materials or equipment storage, maintenance, measures used to control the quality for stormwater associated with construction activity, or other industrial stormwater directly associated with construction activity.

Construction of the rail trail would exceed the 1-acre disturbance threshold set forth under NPDES and therefore require a permit. In order to apply for permit coverage the operator (Town or contractor) will need to submit a NOI, Stormwater Pollution Prevention Plan (SWPPP), and documentation of eligibility to the Environmental Protection Agency (EPA). The SWPPP details construction activities, erosion control measures, and inspection schedules to be implemented during construction to ensure that the construction activities do not have an adverse impact on wetlands and waterways.

With respect to stormwater runoff, the rail trail will be limited to non-motorized uses (other than occasional maintenance or emergency vehicle). As such, stormwater runoff will not be a source of pollutant loading (e.g. heavy metals, oils). Regardless, no direct discharges from rail trail construction should be channeled (tributary) to wetlands or waterways. Instead, non-point discharges in the form of stormwater runoff should be directed to existing and new swales along the trail edge. These open swales capture runoff and allow the rainwater to percolate into the soil. In addition, the profile of the rail corridor is relatively flat. Therefore, the rail trail will need to be raised slightly above the surrounding ground and have a cross pitch to ensure the water drains off the trail surface. The direction of the cross slope should preserve the natural drainage patterns at the site. An erosion and sediment control plan will also need to be implemented during construction to effectively prevent sediment and silt runoff to adjacent resource areas.

The goal of stormwater design will be to maintain existing swales and drainage patterns, allow rainwater to percolate into the soil, avoid point source discharge and meet current Massachusetts Stormwater Management Guidelines and Phase II of the NPDES program.

3.6 Summary

TO BE COMPLETED

4 Contamination Issues

The purpose of this section is to identify potential contamination issues within or in close proximity to the project corridor.

Contamination along a former rail corridor is typically the result of either residual contamination from railroad operations or contamination associated with adjacent uses along the corridor.

The most common contamination found along a rail corridor is residual contamination from railroad operations. According to the Rails-to-Trail Conservancy's study on "Understanding Environmental Contaminants" (October 2004), the most commonly reported contaminants along rail corridors include arsenic, which was used as an herbicide to control weeds, metals and constituents of oil or fuel (petroleum products), which likely dripped from the rail cars as they passed over the corridor. Coal ash is also considered residual contamination. In addition, any existing railroad ties along a corridor were likely treated with creosote and therefore need to be removed and transported in accordance with local, state, and federal hazardous waste disposal requirements.

There is also the possibility that use histories of adjacent properties may have resulted in contamination along the corridor. Such histories could include improper disposal actions along the rail corridor or a release of oil or hazardous material on an adjacent site. A preliminary hazardous waste and contaminated materials screening was conducted for the project corridor. The preliminary screening is a general review to identify properties in close proximity to the project area that could either contain or be a source of hazardous wastes or contaminated materials. The screening was limited to conducting a brief visual inspection along the corridor, reviewing the Phase I Environmental Site Assessment prepared by CDW Consultants Inc. (December 2008), and querying information from the following searchable databases:

- Massachusetts Department of Environmental Protection (DEP) Bureau of Waste Site Cleanup (BWSC) database for sites where a release of oil or hazardous material (OHM) has been reported to DEP. At the time the search was run, the DEP maintained site/reportable release database was current as of April 15, 2008. This search was supplemented with the DEP Tier Classified Oil or Hazardous Material Sites (MGL c. 21E) datalayer obtainable from MassGIS.
- Comprehensive Environmental Compensation Liability Act (CERCLA) List (Federal Superfund Site List) for sites. The EPA's Superfund Query Form was used to retrieve data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database.
- DEP Solid Waste Facility (landfills, transfer stations, and combustion facilities) datalayer obtainable from MassGIS.

Sites abutting the corridor were reviewed and documented as part of this screening. Each site was evaluated for potential project impact based on the information provided in the databases including use histories, the type of site and proximity to the project. This screening aims to evaluate more general issues along the corridor and does not involve details on any one property. Sites of known contamination are a greater concern than sites with potential contamination.

4.1 Screening Results

The following table and accompanying text present sites of concern identified during the preliminary screening. The sites identified are listed from north to south as follows:

Table X: Preliminary Screening Results

Site Name	Address	Site Status	Phase / Class	Release Tracking #

Source: Massachusetts DEP Bureau of Waste Site Cleanup Searchable Sites Database (September 2009) and Phase I Environmental Assessment prepared by CDW Consultants (December 2008).

FST LSP CURRENTLY REVIEWING PHASE I ENVIRONMENTAL ASSESSMENT

4.2 Summary

FST LSP TO PROVIDE RECOMMENDATIONS

Also, of recent concern across the state has been the presence of coal ash along former railroad corridors. Coal ash is residual contamination from former railroad operations. This by-product is exempt from the Massachusetts Contingency Plan (MCP). The MCP (310 CMR 40.0000) is the set of regulations that governs the reporting, Study and cleanup of oil and hazardous material spills in Massachusetts. While, it is acceptable to both leave and re-use soil containing coal ash along a corridor, the DEP's anti-degradation policy restricts off-site reuse to a similar setting. Consequently, leftover materials may need to be transported to an approved landfill at additional costs to the Contractor, which ultimately increases the overall cost of the trail project to the Town. It is therefore important for the trail design to balance cut and fill volumes to minimize any transportation of material off-site. This policy does not apply to contamination "hot spots" where contamination other than residual contamination is present. For example, if an oil or hazardous material spill has contaminated the soil along a portion of the corridor, this soil cannot be left in-place or re-used and must instead be cleaned up under the MCP.

Bridge rehabilitation activities will be included as part of this project and therefore may present lead based paint or lead waste concerns. As documented in the Structures section of this report, the containment and disposal of lead contaminated material is expensive and requires strict compliance with worker and environmental protection regulations. The rail trail construction specifications will need to document proper lead containment, handling and disposal procedures to be followed and account for the costs thereof.

It should be noted that the rail trail construction would not introduce any hazardous waste or contaminated materials to the project area.

5 Cultural & Historic Resources

The purpose of this section is to identify cultural or historical resources along the project corridor. Identifying historical and cultural resources early in the project development process will help ensure that proper mitigation measures and specialist work can be incorporated into the next phase of the project. Further, an inventory is now required as part of the MassDOT-Highway Division Early Environmental Coordination Checklist included with the 25% design submission.

The information gathered from these various sources will:

- Assist the Town and project proponents in addressing community and preservation concerns early in the project planning process
- Help ensure that the project proceeds without impacting these important resources
- Identify opportunities to highlight and educate trail users about Natick's history

Should the project advance to the design phase and have the potential to impact cultural or historic resources, a full review will need to be conducted in compliance with the regulations governing Massachusetts General Laws Chapter 9, sections 26-27C (as amended by Chapter 152 of the Acts of 1982 and Chapter 254 of the Acts of 1985) and Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800).

The Massachusetts Cultural Resource Information System (MACRIS) was reviewed to identify known historic and cultural resources in proximity to the project corridor. MACRIS data includes but is not limited to, the Inventory of Historic Assets of the Commonwealth, National Register of Historic Places nominations, State Register of Historic Places listings, and local historic district study reports. None of the properties identified below are currently listed in the National Register of Historic Places according to the National Register Information System maintained by the National Park Service.

Table X documents sites directly abutting the rail trail corridor. The sites are listed in the order in which are they located from north to south.

Table X: Historic Properties Abutting Corridor

MHC Inventory No.	Property Name	Address	Year Built / Established
NAT.M	Lake Cochituate Reservoir		
NAT.916	Cochituate Aqueduct	Lake Cochituate	1846
NAT.918	Lake Cochituate	Lake Cochituate	1846
NAT.901	Boston and Worcester Railroad Bridge	Lake Cochituate	1897
NAT.908	Loker Street Bridge over Penn Central Railroad	Loker Street	1918
NAT.D	Natick Research and Development Laboratories		
NAT.313 *	Hanson, Joshua House	16 North Main Street	1865
NAT.309	Dean, Charles W. Shoe Factory Annex	58 North Main Street	1921
NAT.292	Bird, Warren A. Coal and Wood Company Warehouse	19 Willow Street	1899
NAT.907	Cochituate Street Bridge Over Penn Central RR	Cochituate Street	1896
NAT.291	Shell Gas Station	8 North Main Street	1925
NAT.905	North Main Street Bridge over Penn Central RR	North Main Street	1895
NAT.A	Natick Center Historic District		

Source: Massachusetts Cultural Resource Information System (MACRIS) Database, October 2008.

** Note: Location of property relative to project corridor to be verified with Natick Historical Commission as part of preliminary design phase.*

The project corridor connects to, but is not located within, the Natick Center Historic District. This district is listed in the National Register of Historic Places according to the National Register Information System (NRIS) maintained by the National Park Service (October 2008).

5.1 Summary

TO BE COMPLETED

6 Cross Section

The purpose of this Section is to provide an overview of elements that need to be considered when designing the typical trail cross-sections.

MassDOT-Highway Division and the Federal Highway Administration (FHWA) require that a shared use trail designed or constructed with state or federal funds follow the design standards of the American Association of State Highway & Transportation Officials (AASHTO). However, the MassDOT-Highway Division Design Guide also acknowledges that site-specific conditions often warrant the need to take a more flexible and accommodating design approach. The guidelines set forth in AASHTO constitute the starting point for the design. Deviations from AASHTO can be justified based on site-specific conditions. All projects are looked at by MassDOT-Highway Division on a case-by-case basis.

The design criteria discussed below are based on the following guidelines and regulations:

- MassDOT-Highway Division Project Development & Design Guide (2006)
- AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities (2004)
- AASHTO Guide for the Development of Bicycle Facilities (1999)
- The Rules & Regulations of the Massachusetts Architectural Access Board (521 CMR)
- Americans with Disabilities Act Accessibility Guidelines (ADAAG)
- Manual on Uniform Traffic Control Devices (MUTCD)

The MassDOT-Highway Division Project Development & Design Guide (Chapters 5 and 11) makes the following distinction:

Shared Use Trail: A shared use trail is a facility for non-motorized uses that is independently aligned and can be used for a variety of purposes including recreation, commuting and local travel. MassDOT-Highway Division and FHWA require that a shared use trail designed or constructed with state or federal funds follow the design standards of AASHTO.

Greenway: A greenway trail is a recreational facility through backcountry or other remote areas that is generally an unpaved trail that serve hikers, mountain bikers, equestrians and other off-road users. Design guidelines for greenways are not as well established as those for shared use trails.

Walkway: A walkway can include, but not be limited to, all walks, sidewalks, overpasses, bridges, tunnels, underpasses, plazas, courts and other pedestrian trailways. A walkway functioning as an off-road trail (e.g. not a sidewalk) must meet the Rules & Regulations of the Massachusetts Architectural Access Board for Walkways (521 CMR).

The typical cross section of a trail is typically governed by the existing corridor right-of-way, railbed width and the location of adjacent environmental resource areas.

6.1 Design Criteria

6.1.1 Surface Width

Shared Use Trail: AASHTO recommend a minimum 10-foot surface width for a shared use trail under most conditions. However, depending on the anticipated user types and volumes, a 12-foot wide surface may be advisable. As documented in the Abutter Report prepared by the Natick CRT Task Force in September 2007, it is anticipated that this corridor would be used by residents and workers for commuting and/or recreation. In addition, a 12-foot surface is proposed along the Framingham section of the CRT. Therefore, it is recommended that a 12-foot wide trail be considered along this corridor in order to accommodate a wide range of users and complement the design for the Framingham section of the CRT.

Greenway Trail /Walkway: A 6-foot wide trail would be characterized as a walkway or greenway trail. This width would not accommodate the same range of users as an 10-foot or 12-foot trail due the reduced width and potential for conflicts. A 5-foot wide walkway meets the width requirements stated in the Rules & Regulations of the Massachusetts Architectural Access Board for walkways (521 CMR 22.00). A width less than 5 feet requires passing spaces (60”x60”) to be installed at intervals not exceeding 200 feet (521 CMR 20.5). A 6-foot width is preferred over a 5-foot width because it allows for two people to walk comfortably side-by-side.

Again, all design decisions are subject to review and approval by MassDOT-Highway Division if the project is being funded using state or federal transportation funds.

6.1.2 Shoulders

A minimum 2-foot wide graded clear shoulder should be maintained adjacent to both sides of the trail. This shoulder is not considered part of the traveled way. The shoulder is typically graded to a slope of 1 vertical to 12 horizontal (1:12) to enhance proper drainage to prevent erosion as well as provide a recovery zone for trail users. It is commonly constructed using soft surface materials such as grass, gravel borrow, stone dust, or other stabilized materials.

On a 6-foot wide trail, there are no shoulder width or clearance requirements. However, it is strongly recommended that a 2-foot stabilized shoulder be provided on each side of the trail in order to accommodate occasional access by maintenance and emergency vehicles and reduce the potential for damage to the trail edge. The detailed design of this shoulder surface would be completed as part of the preliminary design phase.

6.1.3 Vegetation

Figure X: Typical Root Barrier Installation

It is typically recommended that existing low-lying vegetation located within 6 feet of the edge of the trail surface be cleared and grubbed. In addition, based on recent rail trail designs, it is recommended that a high-density plastic root barrier be installed along sections of the project corridor where future tree root or vegetative growth may pose an issue. The root barrier effectively redirects tree roots down and away from the trail surface, preventing costly root damage while preserving the health and beauty of mature trees. Figure X shows a typical root barrier installation along a rail trail. Due to its price, root barrier should only be installed in areas where root damage can be anticipated. The barrier depth and material specifications depend on the tree species along the corridor and is typically determined as part of the design process.

6.1.4 Horizontal Clearance

A minimum 3-foot clearance should be maintained from the edge of the trail to signs, trees, poles, walls, fences, guardrails, or other obstructions.

Figure X: Typical Wood Rail Fence Installation

A 5-foot separation from the edge of the trail surface to the top of slope is desirable in areas where the trail is located adjacent to ditches or slopes steeper than 1 foot vertical to 3 feet horizontal (1:3). If this offset cannot be achieved, then a physical barrier such as a wood rail fence, dense shrubbery or a chain link fence, should be installed along the top of slope to protect trail users.

In general, the greater the height of the drop-off, the greater the need for protection. According to AASHTO guidelines, the fence should be set at a height of 3.5 feet (42 inches). Rub-rails are recommended at a height of approximately 3-feet from grade to prevent snagging of handlebars. All fences should be smooth and free of protruding objects such as bolts. An example wood rail fence installation is shown in Figure X.

6.1.5 Cross Slope

Regardless of the width, the trail should have a 1.5% cross slope in one direction to aid in drainage. The direction of the cross slope can vary along the corridor depending upon the topography and adjacent land use. A 1.5% cross slope is the same as a typical sidewalk and meets ADA accessibility guidelines.

6.1.6 Vertical Clearance

A minimum permanent vertical clearance to obstructions of 8 feet is required by 521 CMR and ADAAG. According to MassDOT-Highway Division, in some instances, vertical clearance may need to be greater to permit passage of maintenance and

emergency vehicles. Based on recent trail construction project, a vertical clear zone of at least 12 feet above the finished grade accounts for the size and physical limitations of the construction equipment.

6.2 Typical Cross Sections

Six different trail cross sections were considered along the 2.4-mile corridor. These sections take into account the design elements discussed in the previous section.

- Section A – Typical 12-Foot Trail
- Section B – Typical 10-Foot Trail with Retaining Wall
- Section C – Typical 10-Foot Trail at Route 9 Bridge
- Section D – Typical 12-Foot Trail Adjacent to Driveway
- Section E – Typical 10-Foot Trail in Constrained Area
- Section F – Typical 6-Foot Trail

Each typical cross section is illustrated on the following pages and denoted on the base mapping included in Appendix X.

6.2.1 Section A – Typical 12-Foot Trail

Section A consists of a 12-foot wide surface with 2-foot shoulders adjacent to both sides of the trail, as shown in Figure X. It is recommended that the trail profile grade be raised slightly above the surrounding ground and have a cross pitch to ensure the water drains off the trail surface. Raising the trail slightly will also help balance the cut and fill volumes to minimize any transportation of material off-site.

Where the trail is located in a fill section, the vegetated shoulders constructed along the trail edge will help capture runoff and promote groundwater recharge and infiltration. Consideration should also be given to installing wood rail fence where the trail is located adjacent to 2:1 slopes and embankments 4 feet or greater in height.

Where the trail is located in a cut section, it is recommended that new, vegetated swales be constructed along the trail edge. These open swales capture runoff and promote groundwater recharge and infiltration. The swales will also control flow from the upslope area on either side of the corridor. In addition, raising the trail slightly will help balance the cut and fill volumes to minimize any transportation of material off-site.

Section A will meet MassDOT-Highway Division guidelines for the recommended surface width, shoulder width and offset to obstructions.

6.2.2 Section B – Typical 10-Foot Trail with Retaining Wall

As discussed in Section X of this Study, the trail corridor crosses Lake Cochituate via an existing stone arch. Based on our site visit and prior experience, it is recommended that retaining walls be constructed on both sides of the trail along a portion of this trail segment, as shown in Appendix A. These retaining walls will stabilize and restore the embankment in this segment to its original width.

Due to the embankment width and proximity of environmental resources, it is recommended that the surface width of the trail be reduced from 12 feet to 10 feet.

A similar typical section can be used for the spur connection to Camp Arrowhead from the trail corridor.

Section B consists of a 10-foot wide surface, wood rail fence set 3-foot offset on both sides of the trail, and retaining walls.

Section B will meet MassDOT-Highway Division guidelines for the minimum recommended surface width, shoulder width, and offset to obstructions.

6.2.3 Section C – Typical 10-Foot Trail at Route 9 Bridge

The trail corridor crosses Route 9 via an existing steel thru girder railroad bridge. Based on our site visit and prior experience, it is recommended that the existing steel thru girder bridge over Route 9 be rehabilitated as part of this project, as discussed further in Section X of this Study.

The existing width between the steel girders cannot accommodate a 12-foot trail surface with 2 to 3 foot shoulders. Therefore, it is recommended that the proposed trail width across the bridge be reduced to 10 feet with a 1-foot shy offset to the wood rail fence. A 12-foot clear width will accommodate access by emergency and maintenance vehicles.

Section C will meet MassDOT-Highway Division guidelines for the minimum recommended surface width but will require a

6.2.4 Section D – Typical 12-Foot Trail Adjacent to Driveway

Just south of Washington Street, a commercial business is currently using the railroad corridor to access the rear of their property.

Along this segment, it is recommended that a two-sided wood rail fence / wood guard rail be installed to separate the trail from the existing driveway. The trail side includes a wood rail fence set at a 3'-6" height in accordance with AASHTO standards and the driveway side includes a timber rail set at a car's bumper height. A sturdier 10" center timber post replaces the standard 6" post used in a typical wood rail fence application to account for vehicle impact.

Section D will meet MassDOT-Highway Division guidelines for the recommended surface width, shoulder width and offset to obstructions.

6.2.5 Section E – Typical 10-Foot Trail in Constrained Area

At the southern end of the project, the corridor travels beneath the Cochituate Street overpass and is bordered on both sides by a stone retaining wall. The approximate clear width between the walls is approximately 18 feet.

The existing rail bed width between the walls could accommodate a 12-foot trail surface with 2 to 3 foot shoulders. However, as discussed in Section 2 of this study, this topographically flat area retains standing water following precipitation events. Therefore, as part of the project a swale needs to be constructed adjacent to the trail to restore the original drainage patterns of the site as it existed prior to the removal of the railroad ties and ballast.

Section E consists of a 10-foot wide surface, 2 foot shoulders adjacent to both sides of the trail, a 3-foot offset from the retaining walls, and a restored drainage swale along the east side of the corridor.

Section E will meet MassDOT-Highway Division guidelines for the minimum recommended surface width, shoulder width, and offset to obstructions.

6.2.6 Section F – Typical 6-Foot Trail

At the request of the Committee, a 6-foot wide greenway trail cross section was also considered along the corridor. Section F consists of a 6-foot wide surface with 2-foot shoulders adjacent to both sides of the trail, as shown in Figure X. Similar to the 12-foot trail section, it is recommended that the trail profile grade be raised slightly above the surrounding ground and have a cross pitch to ensure the water drains off the trail surface. Raising the trail slightly will also help balance the cut and fill volumes to minimize any transportation of material off-site.

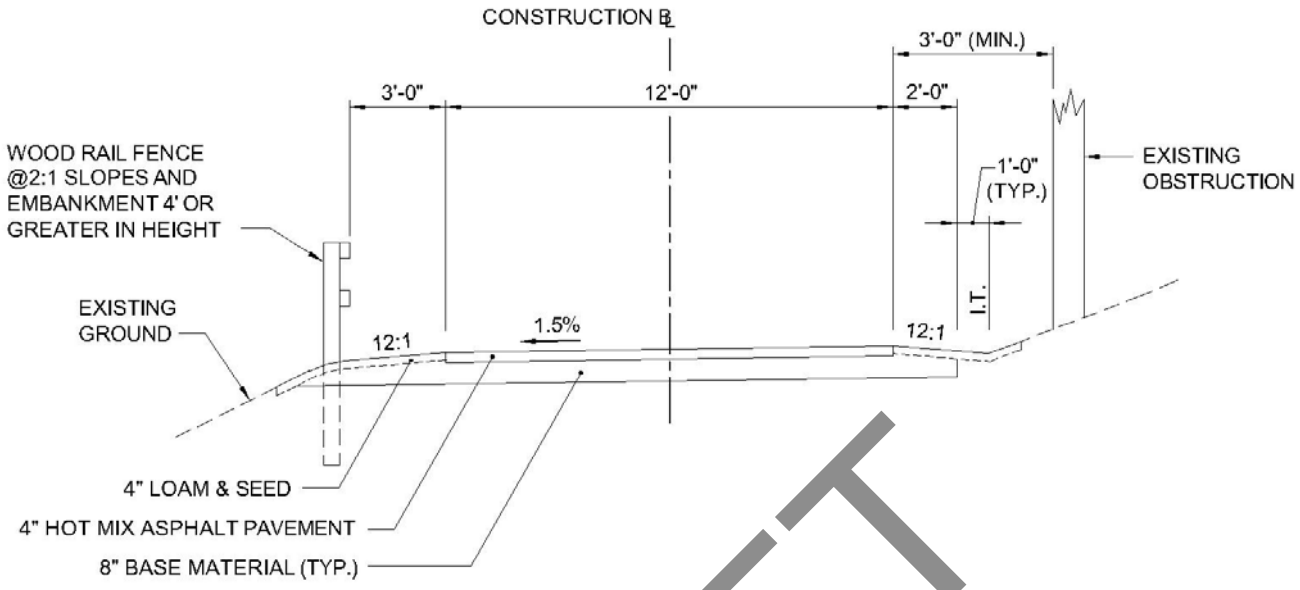
Where the trail is located in a fill section, the vegetated shoulders constructed along the trail edge will help capture runoff and promote groundwater recharge and infiltration. Consideration should also be given to installing wood rail fence where the trail is located adjacent to 2:1 slopes and embankments 4 feet or greater in height.

Where the trail is located in a cut section, it is recommended that new, vegetated swales be constructed along the trail edge. These open swales capture runoff and promote groundwater recharge and infiltration. The swales will also control flow from the upslope area on either side of the corridor. In addition, raising the trail slightly will help balance the cut and fill volumes to minimize any transportation of material off-site.

This typical section would permit occasional access by maintenance and emergency vehicles. However, the vehicles would need to span the trail and keep their tires on the stabilized shoulders to minimize impact to the trail surface.

Section F does not meet MassDOT-Highway Division guidelines for a shared use trail. However, this typical section does meet the width requirements of the Massachusetts Architectural Access Board for a greenway trail/walkway.

❖ Cross Section

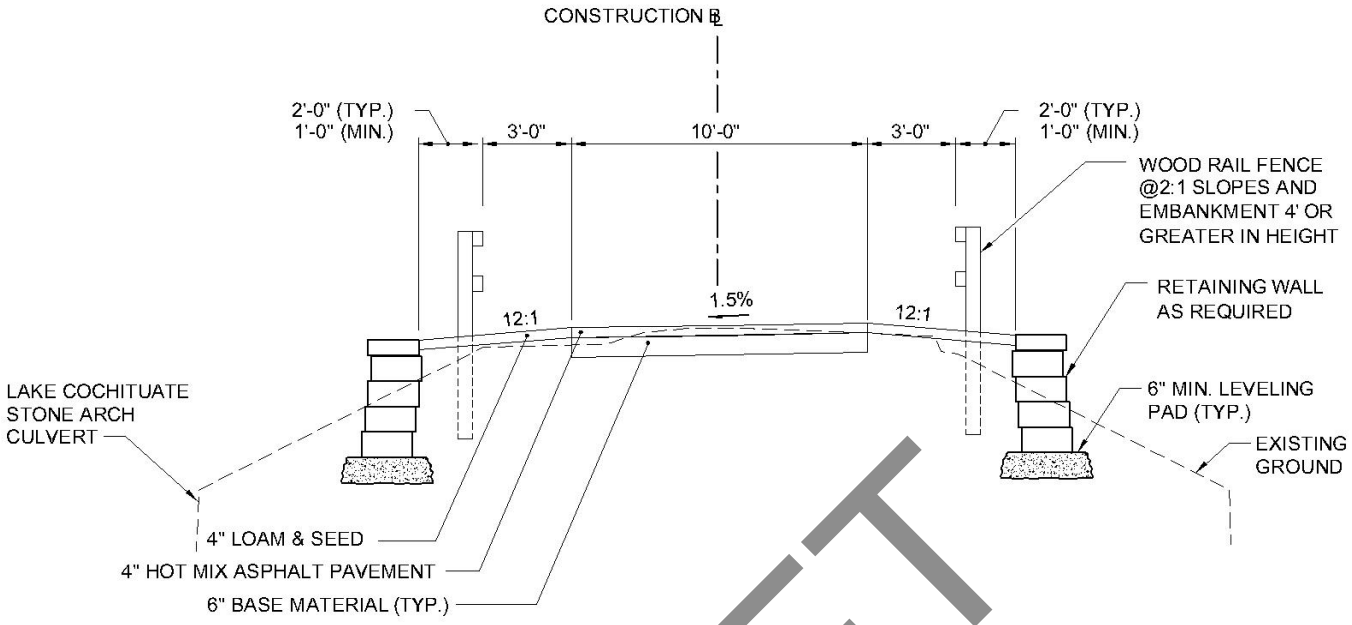


Proposed Trail Cross Section

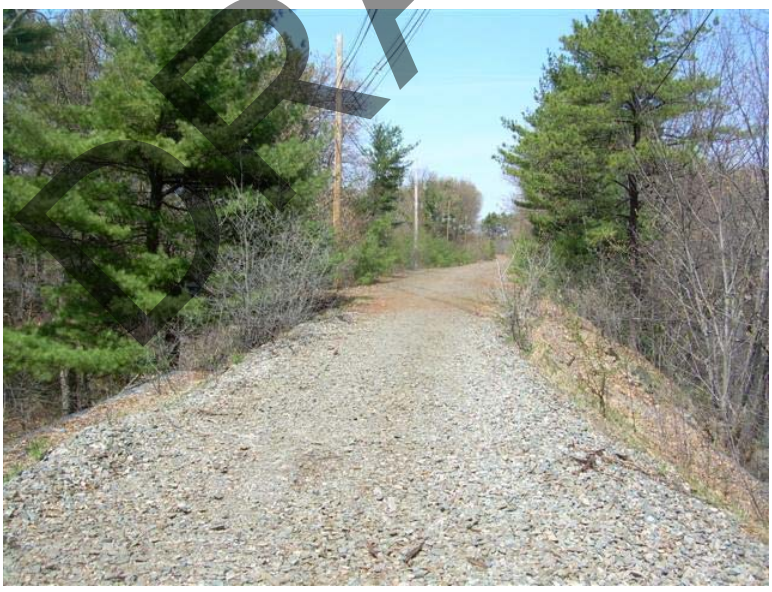
Existing Condition

Figure X: Section A -Typical 12-Foot Trail

❖ Cross Section



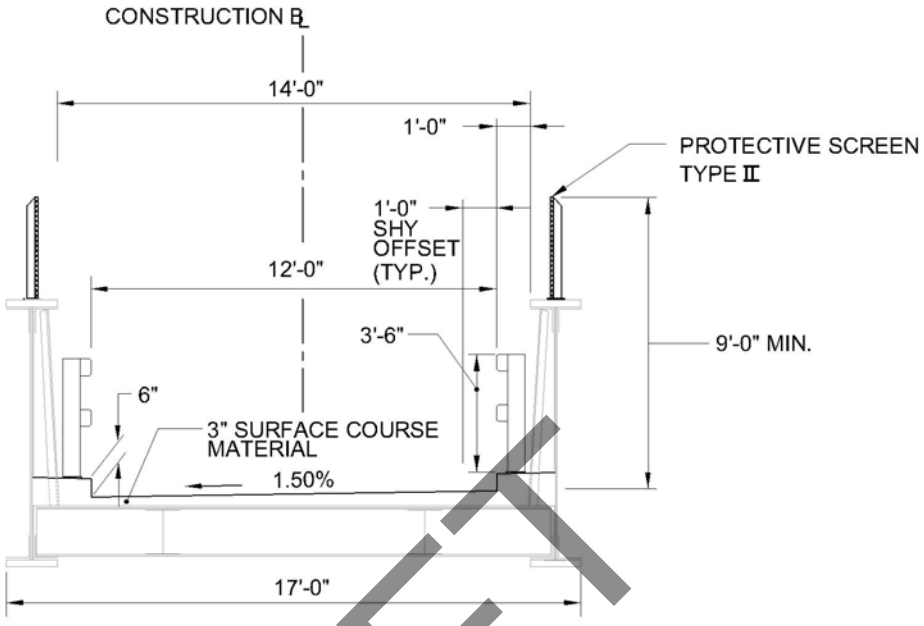
Proposed Trail Cross Section



Existing Condition

Figure X: Section B - Typical 10-Foot Trail With Retaining Walls

❖ **Cross Section**

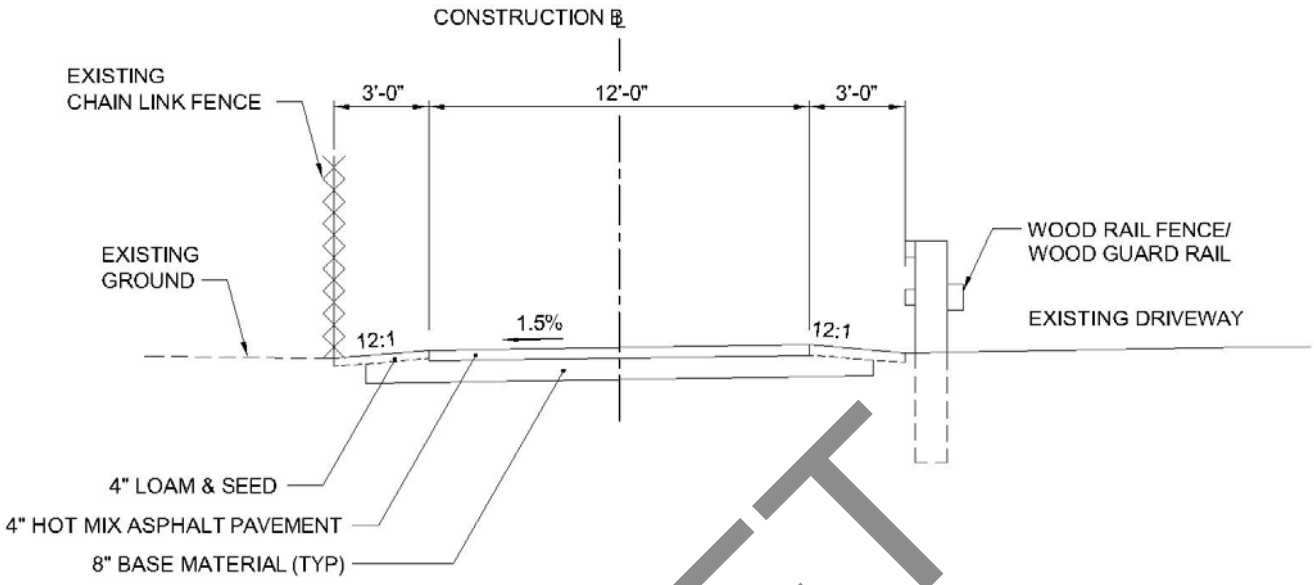


Proposed Trail Cross Section

Existing Condition

Figure X: Section C - Typical 10-Foot Trail At Route 9 Bridge

❖ Cross Section

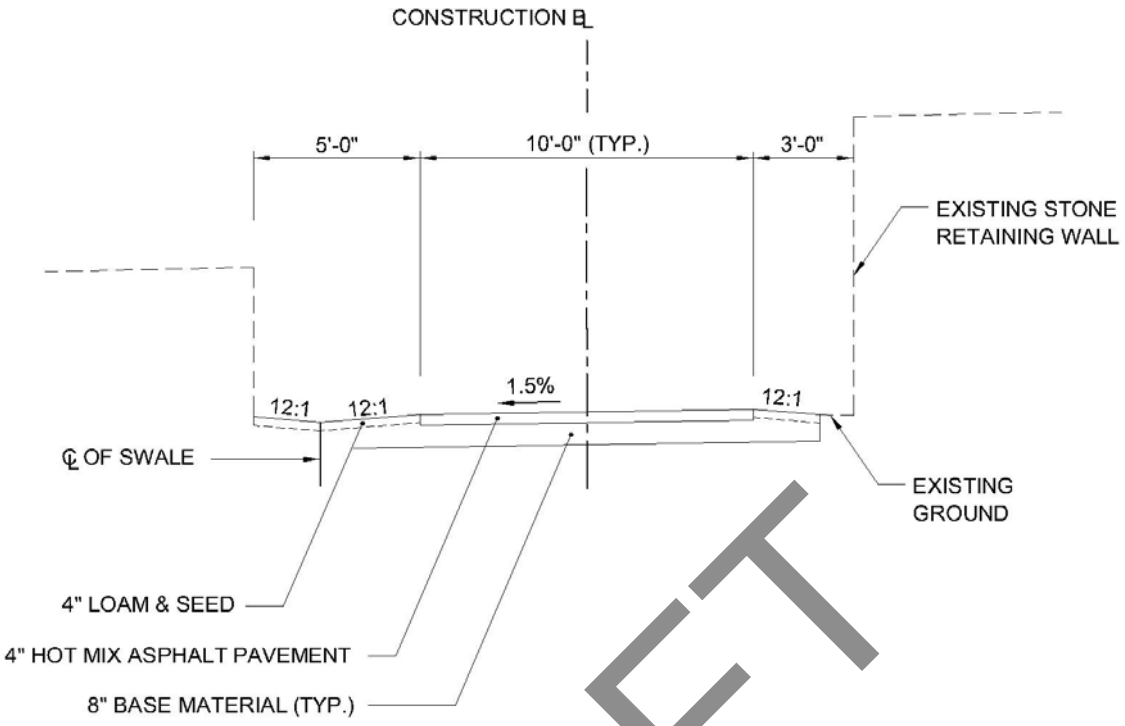


Proposed Trail Cross Section

Existing Condition

Figure X: Section D -Typical 12-Foot Trail Adjacent to Driveway

❖ **Cross Section**

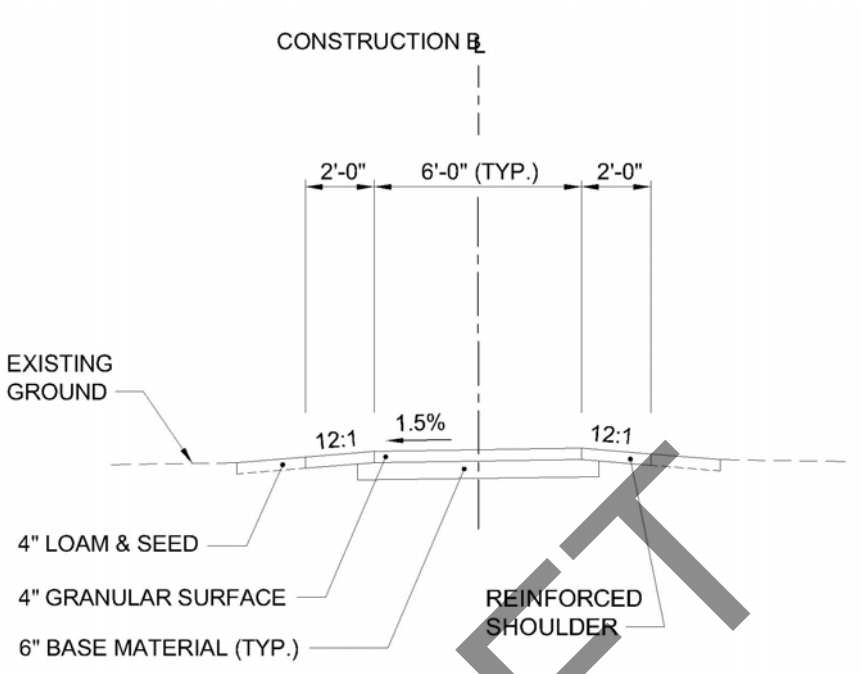


Proposed Trail Cross Section

Existing Condition

Figure X: Section E - Typical 10-Foot Trail in Constrained Area

❖ **Cross Section**



Proposed Trail Cross Section

Existing Condition

Figure X: Section F - Typical 6-Foot Trail

7 Trail Surface

The purpose of this section is to discuss some of the available surface materials commonly used in trail construction.

An important consideration in trail design is the type of surface that will be provided. The selection of a suitable material is a very important aspect of the functionality and aesthetic appeal of the final product.

The selection of surface material primarily depends on:

- Intended types of use
- Intensity of use
- Project setting (environmental, historic and aesthetic)
- Maintenance requirements

Other factors to consider include:

- Project terrain and climate
- Material costs
- Constructability

At a minimum, the selected surface needs to be "accessible" in accordance with the Americans with Disabilities Act (ADA) Accessibility Guidelines (ADAAG). An accessible surface must be "stable, firm and slip resistant."

7.1 Materials

The following is a brief discussion of common surface materials used in trail construction.

7.1.1 Paved Surfaces

Hot Mix Asphalt: Hot mix asphalt, also referred to as pavement or bituminous concrete, is the same surface material used on roadways and other Massachusetts trails (i.e. Nashua River Trail, Assabet River Trail, Ashuwillticook Trail). Asphalt is a durable material which, when properly constructed, requires minimal maintenance and has a long service life. For example, the Cape Cod Trail was recently resurfaced after more than 25 years of use. Surface and crack sealing can further expand its service life. By its nature, asphalt meets ADAAG requirements for firmness, stability and skid resistance. Asphalt accommodates the widest variety of users and is suitable for all levels and abilities.

The color of asphalt tends to contrast with its surroundings more than other surface material options. As an impervious surface, runoff from the asphalt needs to be directed to adjacent vegetated swales. In addition, its hard, smooth surface tends to lead to faster speeds for bicycles and use by inline skaters.

7.1.2 Granular Surfaces

Some naturally occurring granular surfaces are considered firm and stable when properly installed and maintained. When selecting a natural surface, it is important to consider the properties of the material in both wet and dry conditions. For example, many granular surfaces may be firm when dry but get soft when wet. In addition, because these surfaces are not impenetrable, seeds can establish root in the trail to produce weeds without proper maintenance.

Stone Dust: A crushed stone or stone dust mixture can be placed on a compacted base, separated by a geosynthetic liner. When properly compacted and maintained, such granular surfaces can provide moderately firm and stable surfaces to meet ADAAG requirements. Angular, crushed fines will interlock and provide a more stable surface than aggregates with a higher percentage of "round" particles. Stone dust provides a repairable surface with a natural appearance. The performance of stone dust is dependent upon drainage patterns, as it is highly susceptible to rutting and washouts. This type of surface requires a considerable level of ongoing maintenance including such activities as re-grading, resurfacing and weed removal. An edge treatment may be needed to prevent the stone dust from mixing with the shoulder material. Crushed stone or stone dust surfaces also limits the types of user activities. When dry, a stone dust surface is flexible and when it becomes wet, the entire surface softens.

7.1.3 Stabilized Granular Surface

Natural surfaces may also become firm and stable when combined with a stabilizing agent. Stabilizing agents can be in the form of a spray application or a material admixture. This agent, when added or applied to native soils, granite or crushed aggregate screenings, binds the aggregate to provide a firm natural surface that meets ADAAG requirements. As the water evaporates from the mixture, the surface becomes hard and will resembles an asphalt surface. Stabilized granular surfaces can provide increased durability and erosion resistance over conventional granular surfaces. Repairs can be accomplished with a small mixer. The color, texture and appearance of the finished surface depends on the selected aggregate (e.g. tan, gray, red). There are many different products available including, for example, Stabilizer Solutions, PolyPavement, DirtGlue and Road Oyl. Stabilizer Solutions is the same material used at the Minuteman National Park Battle Road Trail and DCR's Charles River Reservation trails. When dry, a stabilizer granular surface is firm and when it becomes wet, the top ¼" of the surface softens.

7.2 Cost Comparison

The following is a comparison of a complete-in-place construction cost of each surface material option. The unit prices include the cost of excavation and fine grading and compacting.

Table X: Surface Material Cost Comparison

Surface Material	Unit Price per Square Foot (Installed)	Notes
Hot Mix Asphalt	$5.00	4" Asphalt 8" Dense Graded Crushed Stone or Gravel Borrow
Granular (Stone Dust)	$4.00	4" Stone Dust 2 layers of geotextile fabric for separation 6" Dense Graded Crushed Stone or Gravel Borrow
Stabilized Granular Surface	$6.00	4" Stabilized Stone Dust (3" nominal compacted) 2 layers of geotextile fabric for separation 6" Dense Graded Crushed Stone or Gravel Borrow

Actual construction costs will vary based on such factors as:

- Economy of scale considerations (total square feet)
- Accessibility of the project site
- Specialized equipment required to perform the work
- Restrictions placed on size and weight of equipment used

7.3 Recommendation

In the past, Transportation Enhancement (TE) funding, administered by MassDOT-Highway Division, prioritized asphalt surfaced trail projects. However, there have been a handful of projects that have been funded and constructed with alternative surface materials. The new MassDOT-Highway Division Project Development & Design Guide specifically addresses the option to use both paved and unpaved surface materials. However, the selected surface will be subject to review and discussion during the formal MassDOT-Highway Division review process.

For the CRT, FST recommends use of a *hot mix asphalt surface* (paved) material for its durability, user friendliness and ease of maintenance. Also from a funding perspective, MassDOT-Highway Division has prioritized paved surface trail projects in the past. The recommended pavement design consists of:

Surface Course: 1.5" Hot Mix Asphalt (HMA) Surface Course Type A
Intermediate Course: 2.5" Hot Mix Asphalt (HMA) Intermediate Course Type B
Base Material: 8" Dense Graded Crushed Stone or Gravel Borrow

Using this design, the estimated lifetime of the pavement wearing surface is approximately 11-13 years. Practicing preservation maintenance would extend the service life of the pavement.

8 At-Grade Roadway/Driveway Crossings

The purpose of this section is to discuss the engineering design issues that need to be taken into consideration where the project corridor crosses roadways and driveways at-grade.

Along the main project corridor, there are a total of five (5) at-grade roadway and two (2) driveway crossings. Introducing a trail crossing at each location presents both operational and safety issues for motorists and rail trail users.

Table X: Roadway/Driveway Crossings along Natick CRT

	Intersecting Roadway
1	Route 30
2	American Veterans Driveway
3	Springvale Water Treatment Facility Driveway
4	Fisher Street
5	Kansas Street
6	Lake Street
7	Speen Street

The development of an appropriate design treatment at each roadway/driveway crossing requires an evaluation of a variety of issues not typically addressed in the traditional approach to intersection design. Traditionally, intersection design has focused primarily on providing sufficient capacity to safely handle expected motor vehicle volumes. However, a successful design must now also consider the expectations of both motorists and rail trail users.

8.1 Design Considerations

The primary design goal will be to develop a consistent strategy to improve intersection safety at each roadway and driveway crossing. Design issues evaluated at each intersection include access, alignment, approach, sight distance, signage & pavement markings, and traffic control.

8.1.1 Access

There is a need to discourage use of the trail corridor by unauthorized motorized vehicles while still providing a reliable means to provide emergency and maintenance vehicle access. Typical means for controlling access where a trail crosses a roadway/driveway include the placement of:

- Steel bollards
- Gates
- Low lying landscaping

8.1.2 Alignment

The project corridor can be characterized by long, uninterrupted stretches that are straight and relatively flat. Although this alignment creates a trail that is easy for users of all ages/abilities to enjoy, it also tends to reduce the awareness of an approaching roadway and results in some users disregarding stop signs.

To address this issue, two different alignment options were considered at each roadway/driveway crossing. The appropriateness of each option depends upon site constraints and the characteristics of the intersecting roadway.

Reverse Curve Alignment: This option introduces short, reverse curves (e.g. 'S' curves) in the rail trail alignment, which effectively increases user awareness of a change in conditions (e.g. an approaching intersection) and requires bicyclists to reduce speed.

At skewed intersections, the reverse curve alignment serves to divert the trail from the current alignment and reposition the user at the preferred crossing location (Figure X). This realignment creates close to a 90 degree crossing and shortens the crossing length, while resulting in minimal trailside disturbance. Recognizing the benefits of this approach treatment, it is also recommended for consideration at locations where the existing crossing is already at 90 degrees. This option typically requires additional vegetative clearing and grading to realign the trail. Therefore, while the Reverse Curve Alignment is the preferred treatment for safety reasons, it must be weighed against the extent of anticipated trailside impacts.

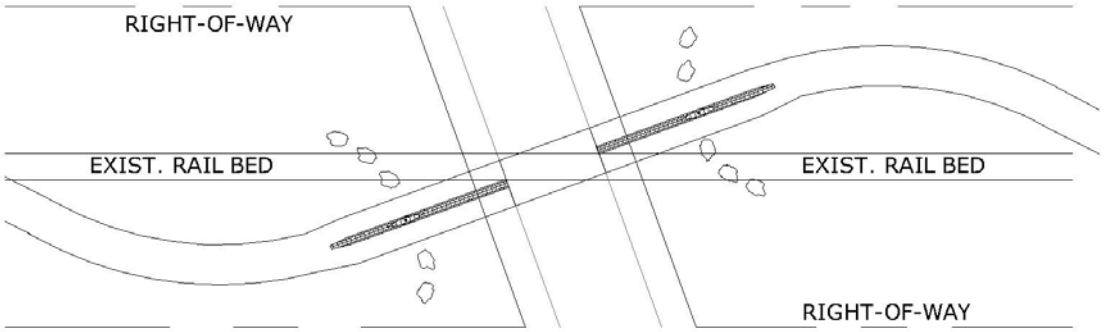


Figure X: Reverse Curve Alignment

Straight Alignment: This alignment option keeps the trail along the existing track alignment and is commonly used where realigning the trail may not be feasible or necessary. This option is often used where either site constraints are too restrictive (e.g. proximity of wetland resource areas, private property) or where the cross street is a low volume/speed roadway. At these locations, a Straight Alignment is typically recommended (Figure X).

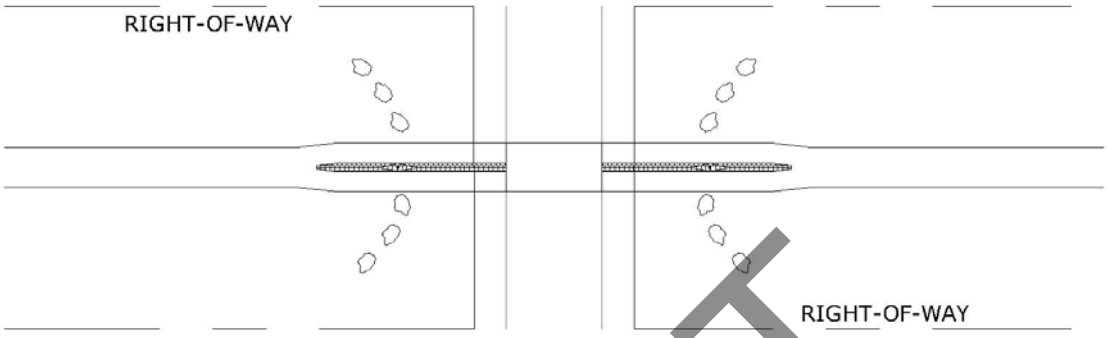


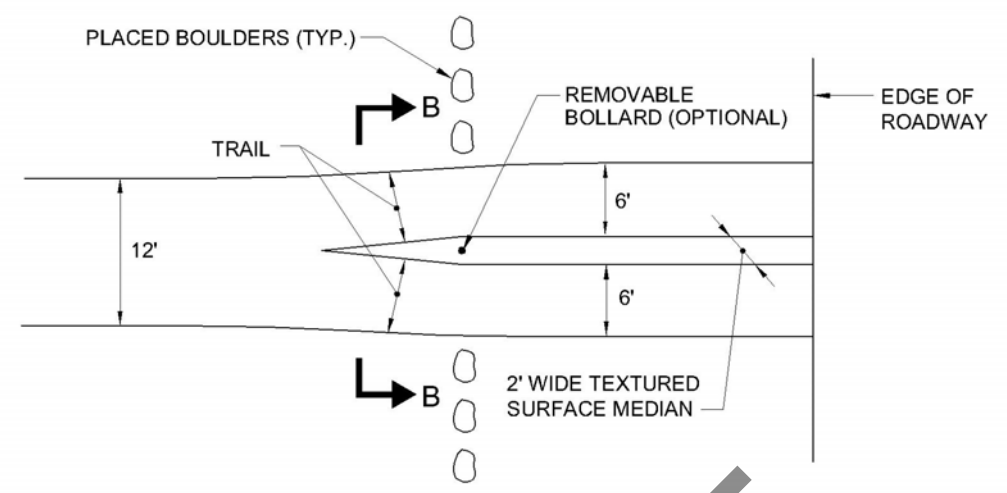
Figure X: Straight Alignment

8.1.3 Approach

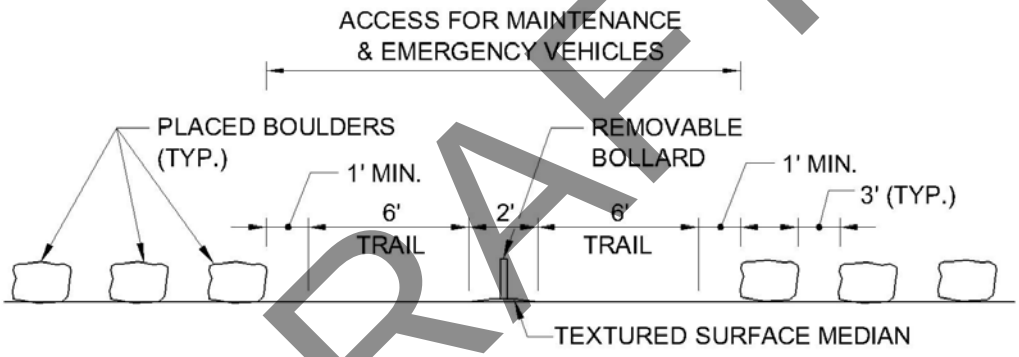
The alignment options discussed in the previous section can be combined with different approach treatments to further define the location of rail trail / roadway crossings to both users and motorists. Two such approach treatments are discussed below.

Narrow Median: As show in Figures X and X, this approach treatment features a flush, 2-foot wide divisional island on the approach to the intersection. A removable bollard is placed in the center of the divisional island to restrict unauthorized motor vehicle access while permitting access by maintenance and emergency vehicles. The flush island can consist of textured pavement in a brick pattern (e.g. Imprint), for example, or simply pavement markings. The island in effect splits the trail into two, one-way routes, a measure that also tends to reduce the speed of bicyclists approaching the intersection. This treatment is well suited for locations where site constraints restrict the extent to which the trail can be widened. In addition, this design raises users awareness of the bollard and requires little to no maintenance.

Figure X: Narrow Median Application



Plan

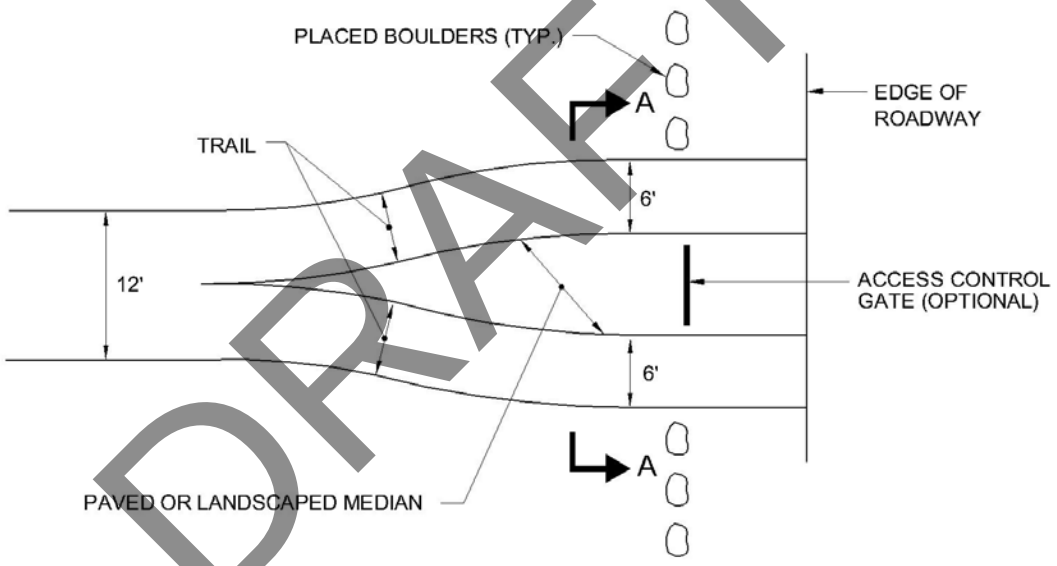


Elevation B-B

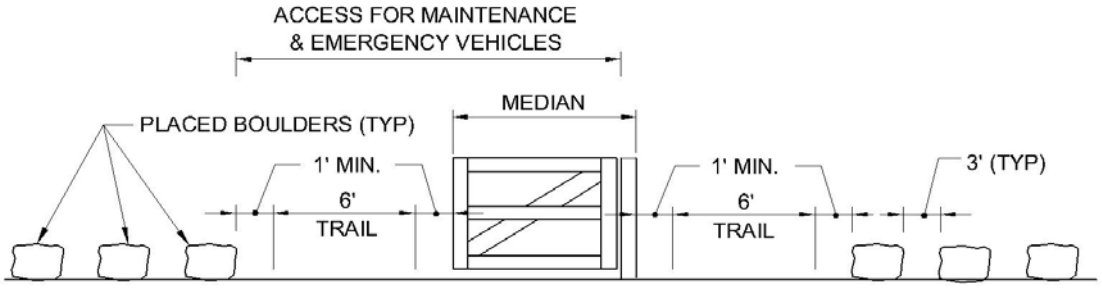
Figure X: Narrow Median Approach Treatment with Bollard

Wide Median: As shown in Figures X and X, this approach treatment features a wider median island with a gate on the approach to the intersection and can be used where site conditions are less restrictive (i.e. available right of way, lack of proximate resource areas). The gate serves to restrict unauthorized motor vehicle access while permitting access by maintenance and emergency vehicles. Common gate designs include a rustic wooden gate with the trail name engraved on it such as the one shown in Figure 33. The wider median can consist of scored concrete or pavers, for example, or low-lying native vegetation that will require minimal maintenance, and not impair gate operation or user sight distance. This treatment functions similar to the narrow median but offers an additional opportunity to create a gateway entrance at each intersection.

Figure X: Wide Median Application



Plan



Elevation A-A

Figure X: Wide Median Approach Treatment with Gate

8.1.4 Sight Distance

Sight distance is the length of roadway visible to a motorist and in this case, also a trail user. Appropriate sight distance is related to driver and pedestrian safety and smooth traffic operations. Sight distance is affected by road geometry; such as grades and curves; roadside vegetation or other objects (i.e. signs, stone walls, fences, and so forth). Sight lines must be kept free of obstructions that might interfere with the ability of a motorist or trail user to verify that the roadway is clear.

Vegetative clearing will likely be required along all roadways to improve sight distance both for users (stopped at the intersection waiting to cross the roadway) and motorists (approaching the crossing). In general, the clearing limits at each crossing will call for the selective clearing and thinning of vegetation approximately 8 feet back along the trail in order to provide a 200-foot stopping distance from the center of the travel lane on the intersecting roadway (See Figure X). This distance will vary depending on the curvature of the roadway and speed of the approaching vehicle, and will be calculated as part of the design phase when detailed survey is available. A graphic showing example clearing limits is included in Figure X.

The design of each roadway/driveway crossing should strive to balance maximum sight lines and minimize associated roadside impacts.

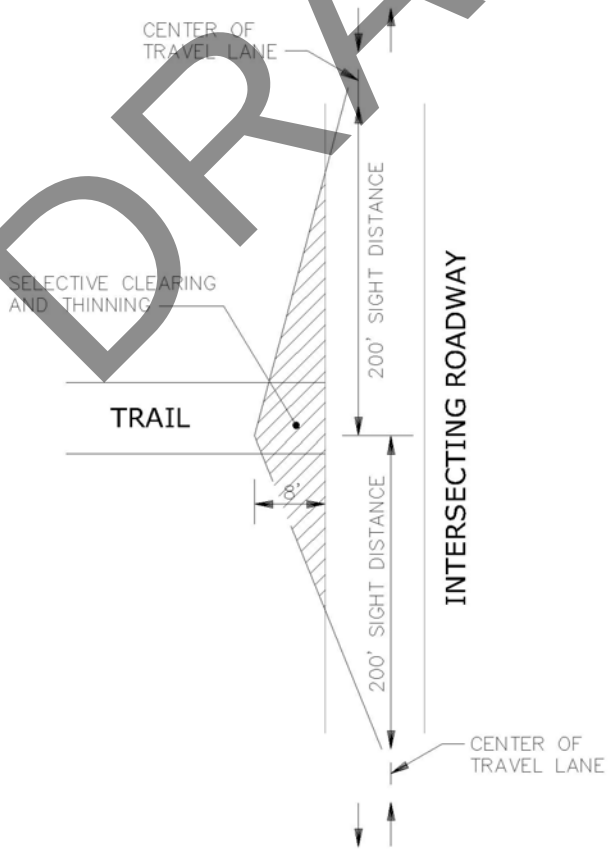


Figure X: Clearing Limits for Sight Distance

8.1.5 Signs & Pavement Markings

Proper warning and regulatory signage and pavement markings will be utilized to improve safety conditions for both trail users and motorists as outlined in the MUTCD.

In addition, for user safety and emergency response actions, it is recommended that a mile marker and signage program be developed to assist users in identifying their current location along the trail.

This program should include:

- Post mile markers located consistently and correctly along one side of the trail
- One half-mile markers located along the trail surface between the mile markers
- Street name signs mounted on top of the stop signs at each roadway/driveway crossing

8.1.6 Traffic Control

A traffic control system improves the safety of an intersection by providing additional warning of the approaching intersection to both vehicles and trail users. As noted in the MassDOT-Highway Division Project Development & Design Guide, traffic signals shall be considered where a trail crosses a roadway with volumes greater than 10,000 vehicles per day. Motor vehicle speeds along the crossing corridor are also an important factor in this analysis.

According to the EOT Road Inventory database, Route 30 exceeds this traffic volume threshold. This crossing is discussed in more detail in Section X.X of this Study.

8.2 Intersection Improvements

The following Section discusses each crossing in more detail and outlines the deficiencies and general characteristics of each intersecting roadway.

8.2.1 Route 30

Source: Microsoft Bing

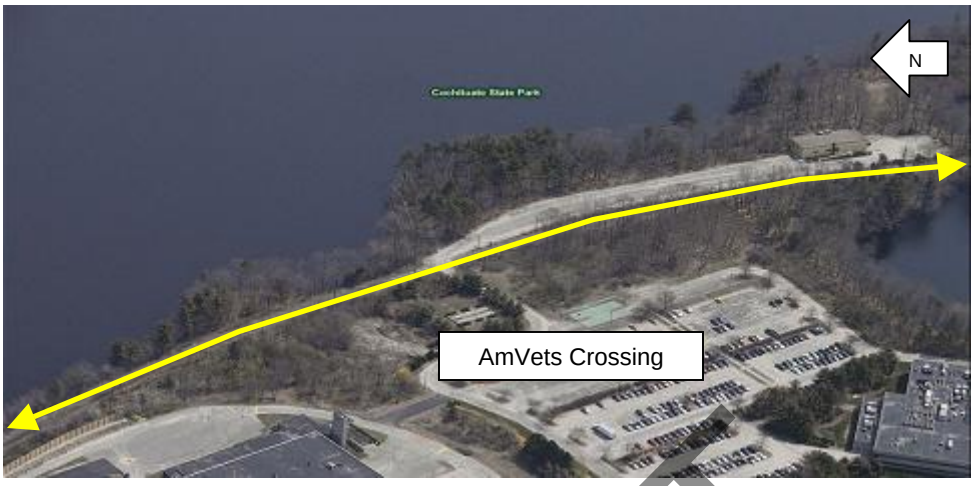
Design Issues:

- Route 30 is a High Volume Roadway (13,600 vehicles per day)
- At crossing, roadway transitioning from 2 lanes to 5 lanes.
- Nearby Traffic signals at Speen Street and TJX Drive
- Adjacent Site Driveways

Design Recommendations:

- See detailed discussion in Section X of this Study

8.2.2 American Veterans (AmVets) Post Driveway



Source: Microsoft Bing

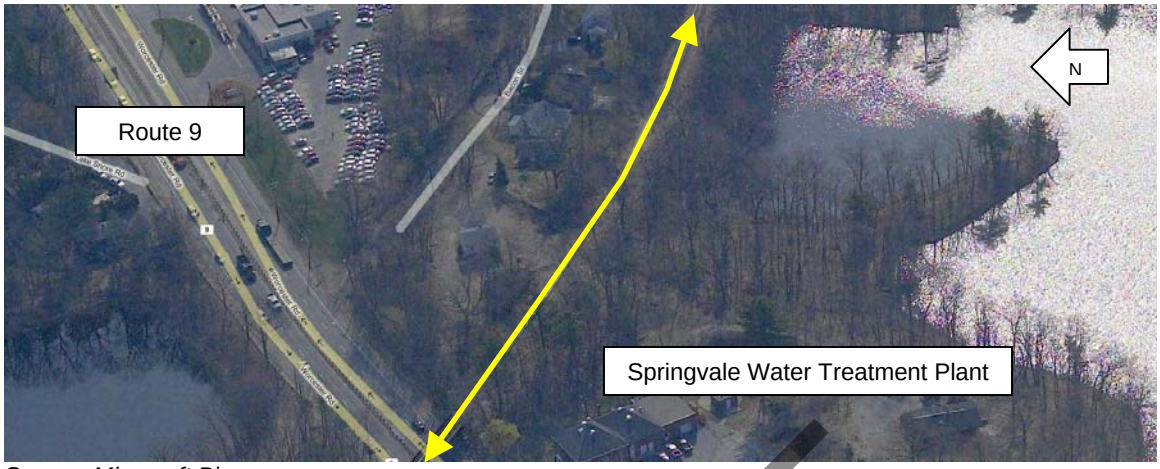
Design Issues:

- This driveway is the only means of accessing the AmVets Post.

Design Recommendations:

- Provide stop control for vehicles entering and exiting the AmVets Post and allow trail users the right of way. Provide warning signs for trail users of crossing.

8.2.3 Springvale Water Treatment Facility Driveway



Source: Microsoft Bing

Design Issues:

- This driveway serves as the rear access and is only one of two means of accessing the gated facility.

Design Recommendations:

- Provide stop control for vehicles entering and exiting the water treatment facility and allow trail users the right of way. Provide warning signs for trail users of crossing.

8.2.4 Fisher Street

Source: Microsoft Bing

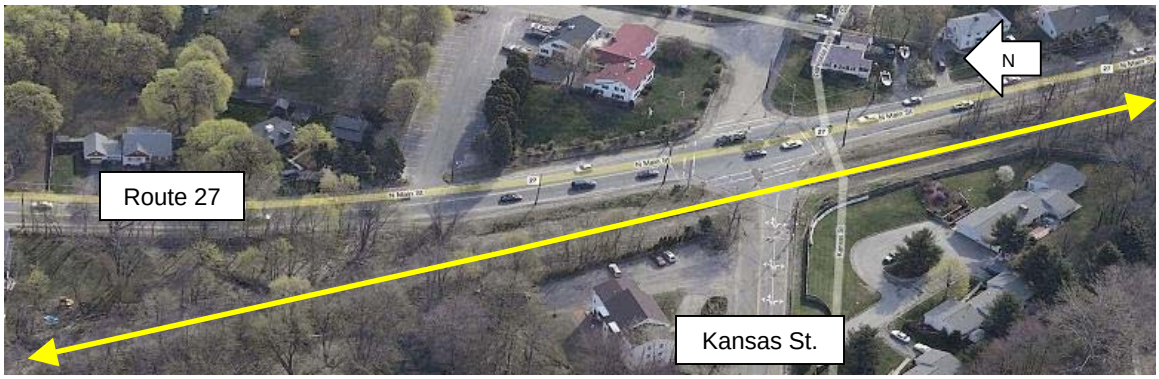
Design Issues:

- Fisher Street is a low volume roadway (600 vehicles per day).
- Need the keep vegetation trimmed to maintain sight lines.

Design Recommendations:

- Provide stop control for trail users. Provide marked crosswalk and pedestrian warning signs for drivers alerting drivers of the trail crossing.

8.2.5 Kansas Street



Source: Microsoft Bing

Type of Roadway:	Local
Jurisdiction:	Town
Est. Volume (ADT):	5900 vehicles per day
Surface Width:	36 feet

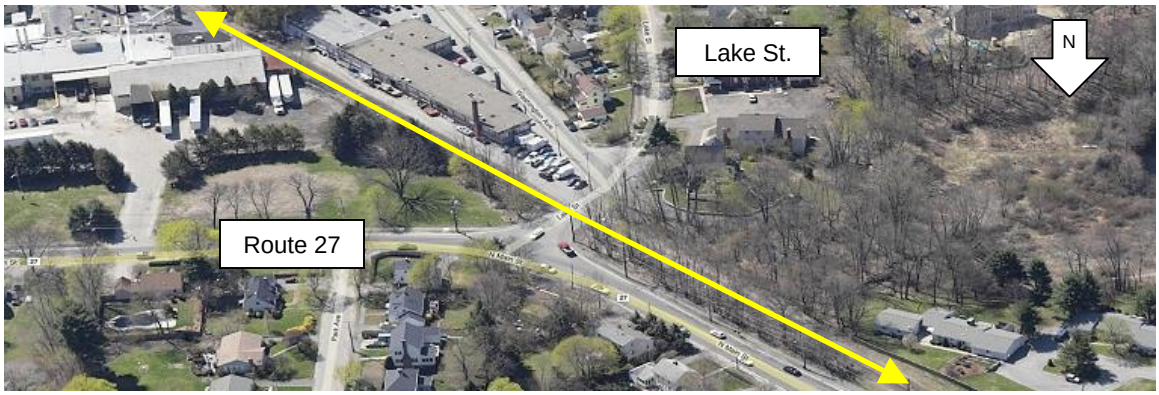
Design Issues:

- Adjacent to existing traffic signal at Route 27/ Kansas Street.

Design Recommendations:

- Coordinate trail crossing with the geometric changes and traffic signal upgrades proposed as part of the North Main Street (Route 27) Improvement Project

8.2.6 Lake Street



Source: Microsoft Bing

Type of Roadway:	Local
Jurisdiction:	Town
Est. Volume (ADT):	8400 vehicles per day

Design Issues:

- Proximity to Route 27/ Lake Street and Lake Street/ Washington Street.
- Signalization has been proposed in conjunction with the Paperboard redevelopment and is included as part of the North Main Street (Route 27) Improvement Project

Design Recommendations:

- Coordinate trail crossing with the geometric changes and traffic signal installation proposed as part of the North Main Street (Route 27) Improvement Project

8.2.7 Speen Street

Source: Google

Design Issues:

- Speen Street is a high volume roadway (38,000 vehicles per day).
- Existing Traffic Signal at Natick Collection.
- Natick Collection has already constructed a multi-use path on-site, connecting from this intersection to the Framingham Town Line.
- Natick Collection provides bus connections to the Metrowest Regional Transit Authority.

Design Recommendations:

- Connect to existing traffic signal at Natick Collection. The existing traffic signal has an existing pedestrian actuated phase for crossing Speen Street.

9 Route 30 Crossing

The purpose of this section is to discuss design options for the Route 30 trail crossing. This crossing is located at the terminus of the Natick section of the CRT, at the Natick/Framingham town line. As discussed in Section X, Route 30 is a principal arterial under the jurisdiction of the Town. Based on the Commonwealth of Massachusetts Office of Transportation Planning Road Inventory Database, the estimated Average Daily Traffic (ADT) along Route 30 is 13,600 vehicles.

Although Route 30 is under the jurisdiction of the Town, the recommended crossing improvements are subject to review and approval by the funding agency. As discussed in Section X, the two most commonly used funding programs for bicycle and pedestrian projects are the Transportation Enhancement (TE) Program and Congestion, Mitigation and Air Quality (CMAQ) Program. If either of these funding programs are used, then the project design would be subject to review and approval by MassDOT-Highway Division.

Three different crossing alternatives were considered as part of this Study:

- Alternative 1: Crossing at Existing Speen Street Signal
- Alternative 2: Crossing at Existing TJX Signal
- Alternative 3: Mid-Block Crossing Along Track Alignment

9.1 Alternative 1: Crossing at Existing Speen Street Signal

The existing traffic control signal at the Speen Street intersection is located approximately 300 feet west of the trail corridor. There is a sidewalk on the southern side of Route 30, but there is not a crosswalk across Route 30 on the east side of the intersection (between Cumberland Farms and the Naked Fish Restaurant). The existing crosswalks are located across Route 30 on the west leg of the intersection and across Speen Street on the southern side of the intersection.

Figure X: Route 30/Speen Street Intersection Looking East Towards Trail

To accommodate trail users, this intersection would need to be upgraded to include a pedestrian crossing on the east side of the Route 30/Speen Street intersection. Upgrades would consist of additional pedestrian crossing signals, a marked crosswalk and wheelchair ramps. The proposed crosswalk would traverse five (5) lanes of traffic without a pedestrian refuge island. The width of the crosswalk would either require a significant amount of time to be reserved for the pedestrian phase, or a concurrent pedestrian phase activated at the same time as the Speen Street northbound/ southbound movement.

Alternative 2: Crossing at Existing TJX Signal

Lake Cochituate

TJX

Cochituate State Park

Alternative 3: Mid-Block Crossing Along Existing Track Alignment

Future Framingham CRT

Home Depot

Wonderbread Spur Trail

Alternative 1: Crossing at Existing Speen Street Signal

COMMONWEALTH ROAD (RTE 30)

FRAMINGHAM

NATICK

SPEEN STREET

CHRYSLER ROAD

DRAFT

Data Source: The *Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs, Town of Natick GIS Division*

0 100 200 400 Feet

Legend

- Trail Typical Section A
- Letter Indicating Matching Typical Section
- Potential Parking Location
- Alternative 1
- Alternative 2
- Alternative 3
- Property Lines
- Town Boundary
- DEP Wetlands
- DEP Stream
- NHESP Rare Species Habitat
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools

COCHITUATE RAIL TRAIL STUDY

Natick, Massachusetts

Figure X: Route 30 Crossing Alternatives **Sheet 1 of 1**

To reach this intersection, users traveling north from Natick would be required to travel westward along the existing sidewalk. They could not utilize the existing Route 30 shoulder, as they would be traveling counterflow to vehicles, thereby creating an unsafe condition. On the north side of Route 30, a new sidewalk would need to be constructed along the frontage of Cumberland Farms. Northbound trail users once again could not utilize the existing Route 30 shoulder, as it they would be traveling counterflow to vehicles.

To accommodate users traveling from Framingham to Natick, a new sidewalk would need to be constructed along the frontage of Cumberland Farms. They could also utilize the narrow Route 30 shoulder to reach this intersection. Under Alternative 1, users traveling in either direction would have to cross the access drives for Home Depot, Naked Fish Restaurant and Cumberland Farms.

If Alternative 1 is preferred, then the key design issue at this location will be to discourage users from crossing Route 30 along the existing track alignment and instead travel west to the signalized intersection. "Walk Bikes" and directional signage would be required at this location.

9.2 Alternative 2: Crossing at Existing TJX Signal

The existing traffic control signal at the TJX driveway is located approximately 500 feet east of the trail corridor. There is an existing crosswalk on the west side of this intersection.

Figure X: Existing TJX Signal

Users traveling north from Natick would travel eastward along the existing sidewalk or narrow Route 30 shoulder to reach this intersection. However, users traveling from Framingham to Natick would be required to travel eastward along the existing sidewalk. They could not utilize the existing Route 30 shoulder, as it would require them to travel counterflow to vehicles, thereby creating an unsafe condition. Under Alternative 2, users traveling in either direction would have to cross the access drives for a commercial building and Rosenfeld Concrete Company (2 drives).

If Alternative 2 is preferred, then the key design issue at this location will be to discourage users from crossing Route 30 along the existing track alignment and instead travel east to the signalized intersection. "Walk Bikes" and directional signage would be required at this location.

9.3 Alternative 3: Mid-Block Crossing Along Existing Track Alignment

Figure X: Route 30 Looking West from Track Alignment

Figure X: Route 30 Looking East from Track Alignment

Alternative 3 is a mid-block crossing following the existing track alignment across Route 30. A crossing at this location is complicated by location of the track alignment relative to the existing traffic control signals at Speen Street (300 feet west) and the TJX driveway (500 feet east). The crossing is located where Route 30 eastbound merges from two (2) lanes to one (1) lane and Route 30 westbound widens from one (1) lane to three (3) lanes. Therefore, at this location the roadway is transitioning from 2 to 5 lanes of traffic. Since the crossing is located adjacent to the Home Depot driveway the Rosenfeld Concrete Company and Cumberland Farms there are a number of vehicles turning into and out of site driveways near the track alignment.

At all trail/roadway intersections along the project corridor, proper warning and regulatory signage and pavement markings will be utilized to improve safety conditions for both trail users and motorists. However, due to the high traffic volumes, wide roadway cross section, and vehicle turning movements, it is recommended that a traffic control system be installed at the Route 30 crossing. Typically, the following types of traffic control systems are considered at trail crossings to improve user safety:

- Intersection control beacon
- High visibility warning system
- Push button actuated traffic signal
- Hybrid signal

Intersection Control Beacon

A typical intersection control beacon consists of a four way, single section traffic signal head supported over the center of a roadway on a mast arm. The signal flashes yellow for the vehicles approaching on the roadway and red for rail trail approaches. Standard installation of beacons requires a continuous power source to maintain a flashing indication at all times. Installation costs are approximately $50,000 per location.

High Visibility Warning System

A high visibility warning system is an alternative to a traditional beacon installation. This system flashes yellow warning signal lights toward approaching vehicular traffic when an approaching bicycle/pedestrian is detected. The lights are typically post mounted on both sides of the roadway and face both directions for added visibility. These systems are warning systems only. All laws and regulations regarding crosswalk use still apply.

Figure X: High Visibility Warning System Along Hartford Street

These systems are currently operational at a number of locations in Natick including at the Natick Collection, at three locations on Speen Street, at three locations on Hartford Street and across Route 135 at the West Natick Commuter Rail Station. A high visibility warning system was also installed at two locations along the reconstructed Cape Cod Rail Trail.

The warning lights can be triggered actively using push buttons or passively using sensors located on the signal post or bollards. If passive actuation is used, it will be necessary to ensure that pedestrians and bicyclists pass through the detection zone.

Figure X: High Visibility Warning System Along Cape Cod Rail Trail

Most of these systems utilize a continuous power source. Solar powered systems are also available, but are not in widespread use in the area. Installation costs are approximately $35,000 per location.

Push Button Actuated Traffic Signal

A push button actuated traffic signal consists of two traffic signal heads for each roadway approach, typically supported on a mast arm, and pedestrian signals for the rail trail approach. The signal would display green (solid or flashing) for the vehicles approaching on the roadway and red for rail trail approaches. When a rail trail user reaches the crossing, they would press the pedestrian button to change the signal to green for users and red for vehicular traffic. Installation costs are approximately $75,000 per location.

Because this treatment would control the vehicular traffic by the use of a red light, this location would be required to meet certain warrants for the installation of a traffic signal. These warrants are primarily volume based and are contained in the Manual on Uniform Traffic Control Devices (MUTCD). A revision to the existing warrants is currently being considered for the upcoming amendments. It should be noted that although revisions to the existing warrants are currently being considered, meeting the minimum pedestrian and bicyclist volumes to warrant a traffic signal is extremely difficult for non-urban locations. Therefore, it is likely that a traffic signal could not be installed at this location.

Hybrid Signal

To provide the improved traffic control associated with traffic signals without the lengthy solid red lights that require meeting traffic signal warrants; hybrid signals have been implemented in certain areas of the country. One successful implementation has been the High-intensity activated crosswalk (HAWK) signal, which uses traditional traffic and pedestrian signal heads but in a different configuration. The HAWK signal is activated by a pedestrian push button or passive pedestrian sensor. The overhead signal begins flashing yellow and then solid yellow to advise drivers to prepare to stop. The signal then displays a solid red and shows the pedestrian a "Walk" indication. The system then flashes an alternating red to indicate to motorists that they may proceed when safe. When not activated, the signal is blanked out. To date, this system has not been used in Massachusetts. HAWK signals are currently being considered for inclusion in the 2009 MUTCD update. FST has discussed the use of the HAWK system with MassDOT-Highway Division to determine if this use is likely to be accepted. According to MassDOT-Highway Division traffic engineers, MassHighway is not likely to approve the use of the HAWK System in the near future.

Figure X: Example HAWK signal

Since this system has not been installed in Massachusetts, installation costs are likely to vary. Based on the necessary equipment, this signal would likely cost approximately $75,000 per location.

9.4 Recommended Alternative

It is recommended that the mid-block crossing in Alternative 3 be included in future design phases. It can be anticipated that some users would try to cross at this location regardless of whether they were directed to the existing signalized intersections. Having pedestrians and bicyclists crossing without any treatment would create a dangerous situation for both users and motorists. Formalizing the mid-block crossing of Route 30 along the existing track alignment will help discourage users from crossing at other locations.

FST contacted MassDOT-Highway Division's District 3 office to discuss possible design approaches for a crossing along the existing track alignment. Based on our site walk and discussion with MassDOT-Highway Division District 3, a high visibility warning system (i.e. Cross Alert system) is recommended at the Route 30 crossing. Such an system does not preclude the upgrade to a full signal coordinated with the upstream and downstream signals if the volumes on the trail warrant it at a future date.

This warning system could be combined with the new sign for combined pedestrian/bicycle crossing included in the proposed revisions to the Manual on Uniform Traffic Control Devices (MUTCD).

10 Structures

The purpose of this section is to discuss the existing culvert, bridge, and overpass structures along the project corridor.

10.1 Culverts

Along the right-of-way alignment, several existing culverts convey natural waterways and drainage to either side of the rail bed embankment. The Boston & Albany Railroad Right-of-Way and Track Maps (Valuation Maps) were used as a guide for identifying culverts along the corridor. As the maps date back to 1915, it can be expected that adjacent land uses have changed significantly over time. Consequently, some of the culverts may have been replaced or removed since the time the railroad was in operation.

Each of the culverts listed in Table X will need to be further evaluated as part of the preliminary design phase. This evaluation will include an assessment of existing conditions, including inlet and outlet structure, piping systems, and upstream and downstream channels, as well as documenting recommendations for necessary improvements at each culvert location

The following list of culverts was developed based on the Valuation Maps:

Table X: Culvert Listing

#	Val Map Station	Size / Material	Culvert Number
1	127+31.8	3.0' x 3.0' Stone Box	2.41
Route 9			
2	76+00 (Scaled)	Town of Natick Water Pipe	To Natick Pumping Station
Fisher Street			
3	50+00 (Scaled)	8" Town of Natick Water Pipe	-
4	47+52.4	3.5' x 4.5' Stone Culvert	0.90
5	41+92.0	2' x 2' Stone Box Culvert	0.79
Kansas Street			
6	35+18.1	2' x 1.8' Stone Box Culvert	0.67
7	29+96.2	2' x 2' Culvert	0.57
8	26+85 (Scaled)	12" Sewer Pipe Crossing	Robert Gair Co. Inc.
9	23+00 (Scaled)	Town Sewer	At Lagrange Street
10	19+21.2	24" x 2.5' Stone Box	0.36
Cochituate Street			
11	7+60	3-30" Pipe Culverts	0.14

Source: Boston & Albany Railroad Right-of-Way and Track Maps.

Figure X: Culvert No. 0.90

Figure X: Culvert No. 0.79

10.2 Bridges

Based on the Valuation Maps and our site walk, there are two existing bridges along the project corridor. These bridges are located where the trail corridor crosses:

- Lake Cochituate
- Route 9

Trail bridges must be designed in accordance with the *Guide Specifications for the Design of Pedestrian Bridges* and the *Standard Specifications for Highway Bridges*, both published by the American Association of State Highway and Transportation Officials (AASHTO).

Width: According to the MassDOT-Highway Division Project Development & Design Guide, the minimum clear width between bridge railings should be the same as the shared use trail approach plus a minimum 2-foot wide clear shoulder on both sides of the trail. For emergency, patrol and maintenance vehicle access, the minimum clear width needs to be 10 feet. Carrying the clear width area across a structure provides 1) a minimum horizontal shy distance from the railing and 2) maneuvering space to avoid conflicts with users stopped on the bridge. Variations from these dimensions are typically considered in the Type Study Report prepared as part of the MassDOT-Highway Division 25% Design.

Design Load: Bicycle / pedestrian bridges in Massachusetts are typically designed to accommodate an H10 design load. H10 is a light truck, such as a standard maintenance, construction, emergency or patrol vehicle weighing 20,000 pounds. An H10 design loading is much less than the original railroad loading and should permit reuse of the existing stone abutments.

Materials: Many of the same elements that influence the type of structure also affect the choice of bridge and decking material. Such considerations include, but are not limited to, cost, constructability, future maintenance requirements, environmental impact, and overall aesthetics. Prefabricated structures are the most common type of pedestrian/bicycle bridge used throughout the United States. These bridges come completely fabricated for easy installation and reduced onsite construction costs.

Railing: A wood railing serves to protect users from falling off the structure. Railings should be mounted on both sides of a structure and set at a minimum of 42 inches (3.5 feet) high. The railings should be free of protruding objects to prevent snagging of bicycle handlebars. The railing should tie into a wood rail fence on the approach to the structure. The ends of the wood rail fence should be flared to help direct users onto the structure and so that the blunt ends do not pose a hazard to users.

Fencing: On a bridge over a roadway, a Type II Protective Screen (anti-missile fence) is required as a measure to block objects or debris from falling or being thrown off the bridge onto the roadway below. A protective screen is not needed for a bridge over water.

10.2.1 Lake Cochituate

The trail corridor crosses Lake Cochituate via an existing stone arch as shown in Figure X. Based on our site visit, it is evident that there is significant erosion along the corridor in this area. As shown in the photos below, wire mesh gabions filled with stones and timber walls have been installed along the corridor above the stone arch as erosion control measures.

Figure X: Stone Arch Over Lake Cochituate

Figure X: Wire Mesh Gabions for Erosion Control

Figure X: Timber Retaining Wall for Erosion Control

In order to construct a trail in this area, the existing rail bed would need to be widened to provide the minimum recommended trail width and install a wood rail fence for user safety. At the same time, the existing erosion issues should be addressed to avoid future embankment failure.

A modular block retaining wall system is recommended at this location. Modular block walls are typically pinned segmental retaining walls. They are quick and easy to install, offer superior durability and have many design/build options along with a variety of styles and sizes. Another advantage of this wall system is the small amount of excavation required. Unlike a typical concrete or stone wall which requires four feet of excavation for the foundation, the modular block retaining wall only needs an 18-inch excavation for the leveling pad foundation. This is especially important at this location where there is not much vertical distance between the trail surface and the top of the existing stone arch.

Figure X: Retaining Wall Over Herring River
Cape Cod Rail Trail

Figure X illustrates a photo of a completed wall over the Herring River in Harwich along the Cape Cod Rail Trail (CCRT).

10.2.2 Route 9

The trail corridor crosses Route 9 via an existing steel thru girder bridge as shown in Figure X. Based on our site visit and prior experience, it is recommended that the existing steel thru girder bridge over Route 9 be rehabilitated as part of this project. A typical section for this bridge crossing is included in Section 7 of this Study. The proposed trail width across the bridge is 10 feet with a 1-foot shy offset to the wood rail fence. Based on our field measurements, the existing bridge is wide enough to accommodate this section.

Figure X: Existing Steel Thru Girder Bridge
Cochituate Rail Trail Over Route 9

During the design phase, structural engineers will need to inspect the bridge, prepare a rating report and determine the areas of work needed to rehabilitate the bridge for the rail trail. Anticipated work will include removing the existing ties; cleaning, deleading and painting the existing steel stringers; installing a concrete deck; placing a waterproof

membrane on the deck; constructing a new sub-base with a bituminous concrete trail surface; installing a wood railing/fence; mounting a Type II protective fence/screen; and applying an anti-graffiti coating to the wingwalls and abutments.

Testing for lead paint on the steel stringers was not completed as part of this Study. However, assuming the presence of lead paint, the reuse of the existing structure is a labor-intensive activity due to the need to clean and delead the existing steel stringers prior to applying new paint. Lead paint removal operations present particular environmental constraints. Special precautions need to be taken to prevent lead emissions into the environment, as lead is a known air, soil, and water pollutant. In order to safely delead the steel stringers, the bridge would need to be either 1) encapsulated on-site or 2) transported to a controlled environment. Off-site removal will require truck crane access, sufficient maneuverability and a staging (i.e. lay down) area. It is possible that the paint may have worn away from the steel over time, thus reducing the work effort required and associated cost of lead paint removal. Lead testing will need to be completed during the design stages of the project to verify the extent of lead paint on each bridge and more accurately quantify the extent of deleading operations. The painted steel stringers will also require periodic repainting over its lifetime.

Replacement of the structure with a prefabricated truss-type steel bridge is another alternative that could be considered. This alternative would also allow for an increase in the vertical clearance of the bridge. The current clearance is posted as 14'-0". This decision would need to be considered in conjunction with the proposed improvements at the Route 27 bridge (13'-8" posted clearance) and existing clearance at the Speen Street bridge. If it is determined that an increase in vertical clearance is recommended, the existing stone abutments would need to be raised with a concrete "seat" for the bridge. Most prefabricated bridges come in 10-foot and 12-foot widths, with special widths available upon request. Additional width can add significant costs to a bridge. The additional width can also require the bridge to be transported in two pieces and assembled on site. These bridges come completely fabricated for easy installation, thereby reducing the construction time. The bridges are transported via truck and set on the abutments using a crane. Bridge installation of this size will require truck crane access, sufficient maneuverability and a staging (i.e. lay down) area.

During the project development and design process, a Type Study report would need to be prepared to further detail the various bridge design alternatives and recommend a preferred structure type for implementation. Pending MassDOT-Highway Division review and approval, bridge sketch plans would then be prepared for the bridge in accordance with the MassDOT-Highway Division Bridge Manual.

Below is the bridge section and photos of a steel thru-girder bridge that was rehabilitated as part of the Nashua River Rail Trail project. This bridge carries the trail over Route 119 in Groton, MA. This bridge is very similar to the Route 9 bridge.

Figure X: Rehabilitated Steel Thru Girder Bridge
Nashua River Rail Trail Over Route 119

10.3 Overpasses

The trail corridor crosses beneath two local roadways via existing overpasses of different type. Based on our site visit and prior experience, no work is proposed to either of these underpasses as part of this project.

10.3.1 Loker Street

Figure X: Loker Street Overpass

According to the Massachusetts Cultural Resource Information System (MACRIS) database and Railroad Valuation Maps, this overpass dates back to 1918. From above, the existing overpass is marked as 'Bridge Closed' with concrete jersey barriers barricades at either end. This existing timber structure will not be impacted as part of the proposed trail construction. There is sufficient horizontal clearance to maintain a minimum 3-foot offset from the edge of the 12 foot trail surface to the timber support beams. However, consideration should be given to installing a section of wood rail fence with flared approaches to remove the risk of a user or maintenance/emergency vehicle from hitting the timber support beams.

10.3.2 Cochituate Street

The Cochituate Street overpass was recently reconstructed and appears in good condition.

A typical section for the trail in the vicinity of the overpass is included in Section 7 of this Study. The proposed trail width along this corridor segment is 10 feet. There is sufficient horizontal clearance to maintain a minimum 3-foot offset from the edge of the 10-foot trail surface to the abutments and stone retaining wall. There also appears to be adequate vertical clearance.

Figure X: Cochituate Street Overpass

11 Trail Access

The primary access points will be located where the rail trail crosses local roadways and abuts publicly owned land.

The proposed trail will provide improved bicycle and pedestrian access to:

- Cochituate State Park
- Natick Collection Paths via Wonderbread Spur
- Camp Arrowhead
- Navy Yard Field
- Anniballi Park (Pegan Cove Park Park)
- Commuter Rail Station
- Natick Center

Proper directional signage matched with improved connections to local trail systems or along public roadways will improve resident and visitor access to these Town destination points. Providing alternative ways to access the rail trail will reduce the need for extensive parking areas and reduce vehicle traffic associated with the trail.

Cochituate State Park
ADD DESCRIPTION ON TYPE OF CONNECTION (SIDEWALK)

Natick Collection Paths via Wonderbread Spur
ADD DESCRIPTION ON TYPE OF CONNECTION (SPUR)

Camp Arrowhead
ADD DESCRIPTION ON TYPE OF CONNECTION (SPUR)

Navy Yard Field
ADD DESCRIPTION ON TYPE OF CONNECTION (ABUTTING)

Anniballi Park (Pegan Cove Park)
ADD DESCRIPTION ON TYPE OF CONNECTION (ON-ROAD)

Natick Center and Commuter Rail Station
ADD DESCRIPTION ON TYPE OF CONNECTION (COMBO OF TRAIL to PLATFORM, ON-ROAD BIKE LANES, SIDEWALK)

INSERT ALTERNATIVES GRAPHIC

12 Parking Areas

Trailhead parking provides points of access for rail trail users. These access points will not only accommodate people from the immediate area, but those who have traveled further to use the trail. Although a number of residents will likely walk or bike to the trail from their homes, it can be anticipated that many people will also choose to drive.

Along the project corridor, there are limited locations where existing Town facilities could be utilized for rail trail parking. Therefore, it is recommended that rail trail parking areas be considered at the following locations:

- Chrysler Road
- Mechanic Street
- Natick Center
- American Vets Post
- Existing businesses

The location of each of these potential parking areas relative to the railroad corridor is shown on the mapping in Appendix A. Each of these parking areas will need to be further explored as part of the Preliminary Design Phase when more detailed survey is available in order to further assess lot size, feasibility, practicality, permitability and safety issues associated with each area.

Chrysler Road

DESCRIPTION TO BE COMPLETED

Figure X: Chrysler Road

Mechanic Street

DESCRIPTION TO BE COMPLETED

Figure X: Mechanic Street

Natick Center
DESCRIPTION TO BE COMPLETED

Figure X: AmVets Post Parking Area

Private Property
DESCRIPTION TO BE COMPLETED

Figure X: Trail Connection to Natick Collection Parking Areas

13 Mitigation Measures

The purpose of this section is to outline potential measures to mitigate the impact of trail development on abutting properties and sensitive resource areas.

The mitigation measure that is selected is based on location specific conditions and the input of the abutting property owner. One abutter may request a stockade wood fence whereas another may prefer evergreen trees. The design consultant and Town will work with individual abutters to develop a mitigation design that addresses their concerns.

There are three primary mitigation measures that are typically used to control and block unwanted access from a rail trail to abutting properties. These measures can retain the privacy of abutting properties, without sacrificing the overall visual quality of the corridor. These measures include:

Signage: Signage identifying where the adjacent land is private property is a basic measure that can be used to deter trespassers. Signage used in combination with the other mitigation measures listed below will improve its effectiveness in controlling unwanted access.

Fencing: The installation of a 3.5-foot high wood rail fence or post and rail fencing along the corridor can discourage users from traversing an adjacent side slope or wandering outside the right-of-way in search of a new vista. Low growing, native plantings could be massed in natural forms along the fencing to further discourage unwanted access. Six (6) foot high chain link fences also provide a physical barrier between the trail and adjacent property but are unattractive in comparison to more natural looking materials. Another fence option that is typically used is a wood stockade fence.

Vegetation: One of the primary design goals is to maintain the natural vegetative buffer between the rail trail and abutting properties. Typical clearing limits call for trees to be removed within 5 to 7 feet on each side of the 8 to 10 foot rail trail surface. The actual railroad right-of-way provides ample width to retain a vegetative buffer between the trail and abutting properties in most areas. However, in areas where there is limited vegetation, landscaping can be planted to further retain the privacy of adjacent uses. Enhancing the vegetative buffer with additional evergreen trees can help address abutters concerns about maintaining privacy.

MassDOT-Highway Division will pay for the construction of all reasonable mitigation requests. However, the Town will ultimately be responsible for maintaining all such mitigation measures located within the rail corridor. In some instances, MassDOT-Highway Division will consider constructing measures on private property as part of a project, which would then become the maintenance responsibility of the private landowner.

Along the trail corridor, two potential locations for mitigation measures include:

- Cochituate State Park
- Springvale Water Treatment Facility

ADD DISCUSSION ABOUT REQUEST FOR CHAIN LINK FENCE BY DCR
ADD DISCUSSION ABOUT INCREASED SECURITY AT WATER TREATMENT PLANT

14 Trail Amenities

The purpose of this section is to discuss opportunities to enhance the corridor through the proper siting of trail amenities including site furnishings, signage, scenic vistas, and landscaping.

14.1 Site Furnishings

Site furnishings will enhance the comfort and enjoyment of trail users. These amenities could include:

- Benches
- Picnic tables
- Trash receptacles
- Information kiosks
- Directional signage
- Bike racks or lockers

Figure X: Picnic Area

Primary considerations for recommending amenities and other trailside items should include:

- Appropriateness
- Functionality
- Attractiveness of design
- Desired materials (i.e. natural and/or sustainable materials)
- Durability
- Maintenance requirements
- Cost

Figure X: Information Kiosk

These amenities should be strategically placed in areas along the corridor where the Town specifically want people to gather.

Figure X: Scenic Overlook

14.2 Scenic Vistas / Rest Areas

There are a number of scenic and historic views along the corridor that could be highlighted through controlled vista pruning and the careful siting of overlooks and rest areas. These vistas / areas can be a simple as a flat, paved pull off adjacent to the trail in the shade with vista pruning to reveal scenic views or as developed as a special location with interpretative signage, picnic tables, bike racks and other amenities.

ADD LIST OF AREAS

14.3 Signage Program

The graphic and architectural design and proper implementation of informational and directional signs are important to the success of the trail and safety of the general public.

Figure X: Interpretive Signage

Interpretive Signage
The placement of ground or rail mounted interpretive signage at these areas can give the trail a unique character and increase users appreciation of the corridor's railroad history and natural resources.

Directional Signage
Signs and markers are critical to the establishment of a cohesive core identity for the trail, for way finding by trail users, emergency vehicles and personnel, and trail volunteers; for insuring the safety of the public using the trail or on public ways at intersections; and for the enjoyment of the trail and trail amenities by its users and abutters.

14.4 Lighting

Lighting can be used to improve safety and aesthetics but must be done with maintenance and abutter issues in mind. It is recommended that the CRT be managed as a dawn to dusk facility and therefore should not be lighted. Evening use for commuters should be permitted only with the use of a bike or helmet light. Lighting the trail would encourage night usage, cause light pollution in residential areas and result in additional maintenance responsibilities and costs to be incurred by the Town.

14.5 Universal Access

The rail trail project should be designed in accordance with the Americans With Disabilities Act (ADA) and the Massachusetts Architectural Access Board (MAAB) Specifications to ensure that the trail meets universal accessibility guidelines for grade, cross slope, tread width, and surface material. Equally important is the need to design trail amenities and parking areas to accommodate all users. For example, parking areas should have van accessible spaces and interpretive elements should be mounted at a wheelchair accessible height.

14.6 Landscaping

Ornamental native plantings and screening will serve to strengthen visual connections along the railroad corridor. Uniform treatments and proper vegetative management will improve the visibility and overall appearance of the rail trail. Some recommendations include:

- Introduce new plantings to reinforce the trail entry points, enhance and support desirable views at scenic vistas and/or areas to rest.
- Strategically locate new plantings to buffer unwanted views and the rear of commercial/industrial buildings.
- Minimize the extent of disturbance to existing vegetation between private properties and the railbed. Install additional plantings, where needed, to retain the privacy of these owners.
- Selectively clear vegetation back from both sides of the trail at entry points, to increase visibility and sight lines and to cue both drivers and trail users of crossings and trail access points.

Figure X: Landscaping

The goal of landscape design should be two-fold, to add to and enhance existing vegetation and introduce new, self-sustaining native species where needed along the corridor.

14.7 Public Art

ADD DISCUSSION ON INCORPORATING PUBLIC ART

15 Cost Estimate

The purpose of this section is to provide a budgetary estimate of anticipated construction and project development costs for the 2.4-mile main trail and 0.25-mile spur trail.

15.1 Construction Costs

The preliminary construction cost estimate is based on:

- Bids received from contractors on other MassDOT–Highway Division advertised trail projects across the state (as published in the CIM Construction Journal)
- Current MassDOT–Highway Division Weighted Average Bid Prices
- Similar work recently designed by the Consultant

The construction cost assumes:

- Use of the recommended Typical Sections (Section 6.2 and Appendix A)
- Implementation of recommended intersection improvements (Sections 8- 9)
- Installation of root barrier along approximately 25% of the corridor
- Rehabilitation of the existing railroad bridge over Route 9 (Section 10.2.2)
- Creation of parking areas as denoted in cost estimate (Section 12)

A 20% contingency cost has been included to account for specific items of work that will be determined during the preliminary design phase. Also, the estimated cost has been escalated using a flat inflation rate (4%) and compounded annually to estimate for expected increases in the cost of construction before the trail may actually be built (a five year timeframe was assumed).

The construction cost estimate has been broken down by major items of work and presented in tabular form in Table X. This estimate is based on 2009 construction costs and does not include design costs. A more accurate estimate would need to be developed during the preliminary design stages of the project in order to program the necessary funding.

Table X: Construction Cost Estimate

Item	Work Description	Unit	Unit Price	Quantity	Cost
1	Clearing and Grubbing	Acre	$15,000	2	$30,000
2	Selective Clearing and Thinning	Acre	$8,000	2	$16,000
3	Borrow for Trail Shoulders	CY	$30	2,700	$81,000
4	Loam Borrow & Seeding for Shoulders	SF	$1	90,000	$90,000
5	Section A – Typical 12' Trail Section (including Spur Trail)	SF	$5	140,400	$702,000
6	Section B – Typical 10' Trail with Retaining Walls	SF	$5	11,000	$55,000
7	Section B – Retaining Walls	SF	$50	4,000	$200,000
8	Section C – Typical 10' Trail Over Route 9 Bridge	LS	$150,000	1	$150,000
9	Section D – Typical 12' Trail Adjacent to Driveway	SF	$5	6,600	$33,000
10	Section E – Typical 10' Trail in Constrained Area	SF	$5	10,000	$50,000
11	Wood Rail Fence	FT	$40	3,500	$140,000
12	Wood Rail Fence / Guardrail	FT	$60	550	$33,000
13	Root Barrier	FT	$10	500	$6,000
14	Roadway Intersection Improvements	EA	$10,000	5	$50,000
15	Route 30 Crossing Improvements	LS	$45,000	1	$45,000
16	Chrysler Road Parking Area	LS	$25,000	1	$25,000
17	Mechanic Street Parking Area	LS	$100,000	1	$100,000
18	Drainage	LS	$25,000	1	$25,000
19	Landscaping & Amenities	LS	$100,000	1	$100,000
20	Wetland Resource Area Protection	LS	$100,000	1	$100,000
	Subtotal				$2,031,000
	Contingencies (~ 20%)				$400,000
	Total Estimated Construction Cost				$2,431,000
	Inflation Adjustment (~4% for 5 years)				$525,000
				Total	$2,956,000
				SAY	**$3.0M**

15.2 Project Development Costs

15.2.1 Property Agreement

Use of the corridor for a shared-use trail will require an agreement with CSX. Soft costs will be required to further evaluate the corridor and negotiate a property agreement that is consistent with the requirements of state and/or federal funding programs.

15.2.2 Design

The engineering design and permitting fee is typically between 10% and 20% of the construction cost, with the variation being attributed to the complexity of design issues along the corridor, number of structures and extent of required permitting. For planning purposes, a ballpark fee for the 2.4-mile trail includes a total estimated design cost of approximately$360,000.

Assuming a MassDOT design process is followed, a 25% MassDOT Design (preliminary design) is typically 40% of the total design fee. Therefore, the 25% Design fee for the trail would be approximately $150,000. This fee estimate is not based on detailed tasks and related work efforts but rather is a ballpark estimate intended for programming purposes.

The 25% Design phase, according to the MassDOT-Highway Division Project Development & Design Guide, includes a complete topographic survey including delineation of environmental resource areas, and preparation of preliminary alignment plans, profiles and typical cross sections for the trail. Based on this information, it is possible to determine the extent of actual impacts, if any, that a trail would have upon adjacent resource areas and properties. During the 25% Design phase, the designer will determine which permits and approvals will be required for the project, and will initiate early coordination with those local and state agencies. Bridge sketch plans are also included in the 25% Design submission.

After the 25% Design is completed and approved by MassDOT-Highway Division, a Design Public Hearing is held in the community. The project can then advance to the final design phases (75% Design → 100% Design → Final Plans, Specifications & Estimates). All necessary permits are secured before the project is put out to bid for construction.

15.3 Maintenance & Public Safety Oversight

As the trail will be a public facility, the Town will be responsible for maintenance to keep the trail in a safe, usable condition. There may also be opportunities to engage local volunteers in the maintenance and oversight of the trail. The use of volunteer labor and/or resources will help reduce the costs to the Town.

Many publicly owned and managed trails incur trail maintenance costs as part of their annual public works or parks & recreation programs and budgets. These entities typically do not keep a separate cost and activity record of the maintenance and management of the trail. Therefore it is difficult to identify the costs related to as-needed, seasonal and long-term maintenance activities.

The Rails-to-Trails Conservancy (RTC) Northeast Regional Office recently completed a study of various trail maintenance and operations issues for more than 100 open rail-trails in the northeast region of the United States. Their findings have been compiled in a publication entitled "*Rail-Trail Maintenance & Operation: Ensuring the Future of Your Trail - A Survey of 100 Rail-Trails*." This publication is available on RTC's website [http://www.railtrails.org/]. The Town should consult this publication for valuable information on budgetary issues, staffing, equipment and various other needs related to the operation and maintenance of a trail.

16 Project Funding

This section discusses the factors to consider when selecting and applying for trail funding from local, state, and/or federal sources.

There are a number of factors to consider when evaluating sources of funding assistance. Most importantly, the Town must assess if the project meets the eligibility requirements of the funding source. With respect to bicycle and pedestrian facilities, certain programs require that the project emphasis be *transportation-oriented* whereas other programs focus on *recreation-related* facilities.

In general, most state and federal funding programs still require a local match. Some programs require a cash match whereas other programs will allow in-kind contributions or "soft" matches. Similarly, some funding programs are administered on a reimbursement basis, which would require the Town to allocate funding up-front and be incrementally reimbursed as the project proceeds from concept to construction.

The Town can also consider pursuing private funding from sources such as philanthropic foundations or corporations located in the community.

16.1 Funding Mechanisms

16.1.1 Transportation-Focused Funding Programs

When applying for transportation-focused funding programs, it is important to stress the project's consistency with transportation plans at the local and regional level. It is equally important to highlight how the proposed facility fits into the larger bicycle and pedestrian network.

The two most commonly used funding programs for bicycle and pedestrian projects are the Transportation Enhancement (TE) Program and Congestion, Mitigation and Air Quality (CMAQ) Program. Both programs were originally funded through the federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and continued via the Transportation Equity Act for the 21st Century (TEA-21). These programs are included in the current reauthorization of the Act, entitled The Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA). The availability of state and federal funding will dictate whether a trail project will proceed through the TE or CMAQ Program.

It is important to note that a project funded under either the TE or CMAQ Program are administered by MassDOT-Highway Division and therefore must adhere to state and federal design standards.

Transportation Enhancement (TE) Program

In order for a project to be considered for the TE Program, the Town needs to submit a funding application to the Metropolitan Area Planning Council. The Commission is responsible for selecting which regional projects are eligible for consideration as TE Program funded projects. Selected projects are reviewed for eligibility and preparedness for implementation before a project is forwarded to MassDOT-Highway Division and the State Transportation Enhancement

Steering Committee. Under this program, the Town (applicant) is responsible for 10% of the project cost. Towns typically do one of the following to meet this requirement:

- Funding 10% of the design cost plus 10% of the construction cost; or
- Funding the entire design (which is typically between 10-20% of the construction cost depending upon project complexity)

Under the first option, the Town is responsible for 10% of the design cost and then the state will reimburse the Town the difference to complete the design. The Town's 10% match for the construction is included in the final construction cost estimate as a list of "non-participating" items (which are items not funded by MassDOT-Highway Division under the specific contract). The Town will be responsible for paying for the "non-participating" items in order to achieve their 10% requirement. This approach equates to the same dollar figure as saying the Town is responsible for funding 10% of the design plus the construction cost.

Under the second option, the Town funds the entire design which is often slightly more than the 10%. This option seems to be more widely used and demonstrates a Town's commitment to help advance the project through the design phase. The Town is responsible for administering the design contract through a MassDOT-Highway Division design and review process. The Town does not provide any funding toward the construction phase of the project under this option. MassDOT-Highway Division would be responsible for constructing the project using the federal funding.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

A trail project often fits the eligibility requirements for both the TE Program and the Federal Congestion Mitigation and Air Quality Improvement Program (CMAQ) of SAFETEA. CMAQ is a transportation air quality improvement program that provides funding for both bike and pedestrian facilities that serve to reduce automobile travel. A Town must complete a CMAQ Air Quality Analysis Worksheet for Bicycle and Pedestrian Projects to document a quantifiable reduction in auto emissions and/or congestion to be eligible under this program. Under this program, the project cost is funded 80% federal and 20% state or local match. The Town must be prepared to provide a local funding commitment comprised of a cash match in the amount of 10% under the same scenarios described under the TE Program.

As part of this process, the Town must also demonstrate the project's feasibility to MassDOT-Highway Division. The first step is to complete a Project Need Form (PNF) and submit it to the MassDOT-Highway Division District 4 Office. This form should also be forwarded to the Metropolitan Area Planning Council for their files. This study should be attached to the PNF to provide additional information. The PNF can be prepared with or without the help of a consultant. A town official should take the lead and act as the principal point of contact for the project in each community. MassDOT-Highway Division will review the PNF and evaluate the merits and readiness of the project. They will also provide the Town with advice on how to proceed, both in terms of the design process and available funding sources. Pending approval of the PNF, the Town will then be asked to prepare a Project Initiation Form (PIF).

16.1.2 Recreation Focused Programs

There are also local, state, and federal programs that help fund recreational and environmentally focused projects. When applying for funds under these programs, it will be important for the Town to stress the conservation and recreation potential of the trail.

Recreational Trails Program (RTP)

The Recreational Trails Program (RTP) provides federal funding support for a variety of trail development and maintenance projects and is administered on a reimbursement basis by the DCR.

The RTP funds up to 80% of each trail project, with at least 20% of the total project cost funded by other sources. The match can consist of money from other sources such as non-federal grants, donations, or municipal funds. A "soft match" in the form of materials, labor, and in-kind services is also permitted. "Soft match" contributions include paid labor, volunteer/donated labor, purchased materials and services, and donated labor and materials. Grant amounts, not including the match, may range from $2,000 to $50,000, with requests greater than $50,000 being considered for regional or statewide projects.

Unlike the projects programmed for inclusion on the TIP or through TE or CMAQ, the RTP requires that projects be primarily recreation rather than transportation oriented. Priority will be given to projects that create or facilitate physical improvements that seek to protect or enhance the site's natural and cultural resource values while also satisfying a recreational demand. Historically, grant applications seeking funds for trail planning and design activities have not been looked at favorably.

16.1.3 Private Sources

There are also a multitude of philanthropic foundations, non-profit organizations, and corporations whose mission may align with the Committee's goal of developing a trail. Donations from formalized private programs are highly sought after and are therefore quite competitive.

The Bikes Belong Coalition, Fields Pond Foundation and Kodak American Greenway Program are four such private entities that provide funding support for bicycle and/or pedestrian projects.

Bikes Belong Coalition

Bikes Belong Coalition is a non-profit organization sponsored by members of the American Bicycle Industry. Bikes Belong provides competitive national grants for projects that will "put more people on bicycles more often." The Coalition accepts requests for funding up to $10,000 for facility, capacity, and education projects. They will not consider projects in which Bikes Belong is the sole funder but will consider proposals where they are initial funder and the project sponsor is looking to leverage the money for other funding programs. More information is available at: http://www.bikesbelong.org

Fields Pond Foundation

The primary mission of the Fields Pond Foundation is to provide financial assistance to nature and land conservation organizations that are community-based and that serve to increase environmental awareness by involving local residents in conservation issues. Proposals from municipal government agencies are encouraged. The foundation accepts project grants for trailmaking and other enhancement of public access to conservation lands, rivers, coastlines and other natural resources. They look for opportunities where a modest investment of grant funds can help in a significant way to improve public access to, and enjoyment of, natural areas, while maintaining the health and integrity of the environment. Projects in which volunteerism is a significant component are more likely to be funded. The expected range of grants is $500 to $25,000, with most falling within the range of $2,000 to $10,000. The Foundation is willing to consider multiple-year grants. Proposals may be submitted at any time, since the Directors meet regularly throughout the year. It is recommended that applicants contact them informally before proceeding to prepare a formal application. More information is available at: http://www.fieldspond.org/

Kodak American Greenways

The Kodak American Greenways Grant Awards Program is a partnership project of the Eastman Kodak Company, the Conservation Fund, and the National Geographic Society. The program provides small grants to stimulate the planning and design of greenways in communities throughout America. Grants may be used for activities such as: mapping, ecological Studys, surveying, conferences, and design activities; developing brochures, interpretative displays, audio-visual productions or public opinion surveys; hiring consultants, incorporating land trusts, building a foot bridge, planning a bike trail, or other creative projects. In general, grants can be used for all appropriate expenses required to complete a greenway project including planning, technical assistance, legal and other costs. Letters of support from associated agencies, public officials, citizen groups or non-profit organizations must be included with the application. Eligible applicants include local, regional, or statewide nonprofit organizations. Although public agencies may also apply, community organizations will receive preference. The maximum grant is $2,500. However, most grants range from $500 to $1,000. More information is available at: http://www.conservationfund.org/

New England Grassroots Environment Fund

The New England Grassroots Environment Fund (NEGEF) is designed to validate and support grassroots activists working on hometown environmental issues. Such environmental issues include smart growth, land use and natural resource management including trail development. The NEGEF Small Grants Program will fund a broad range of activities including, but not limited to, communication needs, computer networking, capacity building, advocacy campaigns, institutional support, conferences, meeting travel, and enhancing partnerships in the region. In 2008, a grant was awarded to the Great Barrington Trails and Greenways Project to develop a public outreach program that included a monthly e-newsletter, a vision map, community walks, and meetings with community groups to promote broader participation. In addition, the Squannacook River Trail Committee in Townsend received a grant to mail informational flyers to share news about the committee's progress and urging

townspeople to continue their support. Other example projects are listed in the NEGEF Annual Report on the website. Grant applicants must be working at the grassroots level, and must demonstrate a major element of volunteer involvement in their programs. Grants range from $500 to $2,500. More information is available at: http://www.grassrootsfund.org/

New England Foundation for the Arts

The New England Foundation for the Arts (NEFA) sponsors the public art program, Fund for the Arts, which is aimed at visually enhancing communities. This grant program promotes civic participation by joining artists and non-profit organizations located within the Greater Boston area. Fund for the Arts supports a variety of projects encouraging community involvement and creating "successful artist-led community partnerships and implementation projects." Application forms usually become available in December, and proposals are accepted through the end of February. Planning and development phase projects can be granted $5,000 - $20,000. Implementation funding can also be awarded up to $30,000, only if the planning and development process has previously been completed. The Concord River Greenway in Lowell, Massachusetts is a project that has used this funding source. The Lowell Parks and Conservation Trust worked together with local artists to explore ideas and concepts to enhance the appearance of the Greenway. More information is available at: http://www.nefa.org

In addition, many private companies sources have financial resources that that they contribute as part of a community outreach program. For example, Intel Corporation of Hudson, Massachusetts donated funds and assistance, in the form of volunteers, to the Assabet River Trail project through their "Intel in the Community" program. In Salisbury, the Timberland Company, local contractors, town workers and volunteers sponsored a cooperative Earth Day work event to help construct an extension of the Salisbury Point Ghost Trail.

To successfully seek funding from private sources, the Town will need to undertake a comprehensive search and marketing effort.

17 Project Implementation

The purpose of this Section is to outline a proposed project implementation plan should the Town secure a lease from CSX and commit to advance the project forward.

Table X provides a listing of possible next steps the Town would need to complete (or coordinate) in order to move forward with the project. Additional follow-up research to this report will be required to advance the project to the design phase. Even more importantly, Natick needs to assess its preparedness for implementation in terms of securing project funding and local support. In addition, the Town will ultimately be responsible for operating and maintaining their portion of the trail post-construction.

IMPLEMENTATION CHART UNDER DEVELOPMENT

Table X: Rail Trail Implementation Plan

Phase	Activity / Task	Responsible Party **

*** The 'Town' as responsible party means a Town staff member, committee or board, as determined by the Town Manager and Board of Selectman.*

Appendix A – Conceptual Design Plans

CONCEPTUAL DESIGN PLANS UNDER SEPARATE COVER

Appendix B – Local Correspondence

Town of Natick

Department of Public Works

To: Martha White, Town Administrator

From: Bill Chenard, Interim Director of Public Works

Date: October 30, 2009

Re: Cochituate Rail Trail

The Department of Public Works completed its preliminary review of the proposed Cochituate Rail Trail. We have the following comments for your review.

1. **Springvale Water Treatment Facility Security** – the proposed trail passes along the boundary of the water treatment plant. There is an existing fence along this boundary. The study should include a review of the existing infrastructure and security cameras. The facility does have security cameras in place; however the existing cameras only provide security to the buildings and surrounding area.

2. **Trash Removal** – the proposed trail should provide adequate trash disposal locations to accommodate the users. These locations should also provide easy access for DPW staff and equipment.

3. **Snow and Ice Removal** – Should there be a desire to use the trail throughout the year, the plan should allow access for snow and ice removal equipment. Consideration should be made to allow snow removal equipment adequate entry and exit.

4. **Vegetation Removal and Mowing** – the conceptual design should consider a landscaping plan that minimizes maintenance. Greenways require considerable mowing. We should consider low maintenance plantings.

5. **Pavement Repair and Replacement** - the pavement must be maintained after completion of the trail. The design should consider paving materials that reduce maintenance costs.

6. **Drainage and Storm Water Management** – The conceptual design can include drainage and storm water management consistent with the town's overall storm water management plan. We strongly encourage the committee to include this as part of the design plan.

Town of Natick

Department of Public Works

The Cochituate Rail Trail will impose additional maintenance responsibility and costs on the town. Incorporating these suggestions will help to minimize these costs.

We appreciate the opportunity to provide this input and encourage the committee to contact us with any questions or comments.

Memorandum

Date: October 29, 2009

To: Martha White, Administrator

From: Chief Nicholas S. Mabardy

RE: Safety Committee Feedback Regarding the Cochituate Rail Trail Conceptual Design

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The Safety Committee met on Tuesday, October 27, 2009 with a full agenda to be considered. I regret that we were unable to devote the entire meeting to this important safety issue. After a brief discussion, it was clear to me that we need to request a member of the Safety Committee be appointed to the Rail Trail Committee as a representative of the department. We did consider the following issues that warrant further consideration:

What measures need to be taken to keep this area safe?

- Bicycle patrols/motorcycle patrols
- emergency vehicle access if someone were injured on the path
- lighting
- maintenance (brush fires/snow removal)

<u>Our newest member of the Safety Committee, Mr. Hurley, sent the following suggestions</u>:

- Signage, especially at road crossings, is very important and it is needed in both directions on the street which is intersected.

- Not sure if Natick has an emergency call box, but I have seen these on other bike trails. (This suggestion warrants further discussion with Chief Mabardy and the others members of the Safety Committee).

- The crossing of Route 30 will create significant safety issues which will need special consideration.

- Maintenance of the trail to ensure safe passage must be understood, for example removal of wind-blown tree branches and leaves which cause a safety issue.

Lt. Lauzon offered the following suggestions:

- The physical condition and safety of the Willow Bridge that crosses Rt.9

- First responders' inability to access the trail in certain sections, primarily between Bacon Street and Chrysler Road.

- Plans, including training and equipment, to locate and recover injured persons in particular areas of the trail not easily accessible today.

- Maintenance of the trail so that user's safety needs are met along with access by public safety personnel.

- Proper directional and safety signage for users, and entry signage and plans for public safety personnel at key areas.

- By-law review regarding the prohibition of all none emergency vehicles using the trail along with appropriate signage including any fines.

- It's my understanding that one of the entry points would be in the area of Pizza Plus on North Main Street. I have concerns relating to the close proximity to commuter rail traffic and the elevation to the surface level.

- Crossings at major roads need to allow for the pedestrians and bicyclists to safely proceed, and also be protected from motor vehicles as they wait. These areas will also require some form of barrier to keep unauthorized vehicles from getting onto the trail.

- Lastly, local abutter public comment and notification makes a project like this move along quicker and easier. Being very transparent when pulling these groups together should be a priority.

- These are only my initial comments. Before providing anything further, I would like to visit a few other trails and speak with the local police and fire departments.

Natick Historical Commission
Natick, Massachusetts 01760
Home of Champions

c/o One Frost Street
Natick, MA 01760

November 10, 2009

Ms. Martha White
Town Administrator
Town of Natick
Town Hall
13 East Central Street
Natick, MA, 01760

RE: Rail Trail

Dear Martha,

The Natick Historical Commission fully supports the implementation of the proposed rail trail along former CMX train tracks. There are several issues to consider that relate to our town character:

1) Where will the entry from historic Natick Center be located for ease of accessibility and link to existing pedestrian pathways trail?

2) How will the trail be marked and branded to represent our community image?

3) The design for modifications of the Route 9 crossing bridge represents a great opportunity to feature the Natick trail system in a highly visible manner.

In conclusion, this project is a great opportunity to provide expanded recreation and transportation options for Natick. If there is a manner in which our Commission can contribute to this effort, please let us know.

Very truly yours,

Stephen N. Evers, AIA
Chairman

CRT Design Input from Members of the Natick Commission on Disabilities

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From: Jennifer Harnish [jharnish@rcn.com]
Sent: Monday, November 09, 2009 8:42 PM
To: 'Kenneth Chernack'
Subject: Rail Trail feedback to pass along

One additional piece of feedback regarding the Rail Trail that I would like to share is that I believe it has the potential to provide individuals with disabilities with a unique opportunity for accessible travel within a natural environment. Although travel via accessible transportation, sidewalks, and street crossings is highly desirable, access to the natural world in our own community in a venue such as the Rail Trail that is not closely impacted by the presence of vehicular traffic with its resulting safety concerns, noise, and pollution, will allow individuals with disabilities to more fully participate in activities along the trail such as exercise, birding, nature observation thru use of available senses, and less traditional transport from one location to another (which can be a more pleasurable experience than riding in a vehicle or walking on a busy sidewalk) to name just a few of the potential activities.

Jennifer Harnish, Ph.D.

Natick Commission on Disabilities

From: Jennifer Harnish [jharnish@rcn.com]
Sent: Monday, November 09, 2009 9:13 PM
To: 'Kenneth Chernack'
Subject: Rail Trail and DCR Univeral Access

Ken,
One additional note on who could be of assistance with accessibility of the Rail Trail. If the trail will be associated with the MA Deaprtment of Conservation and Recreation, then the advisory committee would benefit from contact with DCR's Universal Access department. Universal Access provides equipment and programs across the state to facilitate access for individuals with disabilities to the state's natural resources. Here is there website:
http://www.mass.gov/dcr/universal_access/index.htm
The staff's knowledge and experience with accessible services would be valuable to the committee's efforts.

-----Original Message-----
From: Ryck Lent [mailto:rycklent@verizon.net]
Sent: Wednesday, October 21, 2009 5:56 PM
To: thekurys@verizon.net
Subject: Re: FW: Rail Trail suggestions for persons with disabilities

This is not in the immediate area, but is arguably one of the most spectacular rail trails anywhere in the world.

"Walkway Over the Hudson", opened Octobr 3rd, is a re-purposed 19th-century railroad bridge (finished 1888) that spans the Hudson river between Highland and Poughkeepsie, New York. The walkway is 210 ft above the river! The bridge has been restored, a wide walkway surface and railings (!) installed, and is fully handicap-accessible including parking lots created at both ends. Total length of the bridge portion is 1.5 miles. There are several other rail trails in the immediate area that also look to be wheelchair accessible, though may be somewhat more challenging for the visually impaired.

I visited "Walkway" about a week before it opened (with my Dad in a wheelchair) and got a peek at the surface -- they were still working and not letting anyone on. I cannot imagine a more exciting and invigorating walk or ride. I might venture a guess that the visually impaired may feel more comfortable on this structure than many fully-sighted visitors!

The Walkway site points out that an extensive coalition of business and government groups collaborated to make the project possible. It's not cheap: $38 million. The reason? Adding a tourist draw to the Mid-Hudson Valley was in everyone's interest, and so they made it happen. I grew up in this area and agree that it's a much-needed boost.

I can also vouch for the Minuteman rail trail that runs from Arlington to Lexington and beyond. It's busy but wide enough in most places. The portion of the trail in the center of Lexington shopping district is very popular. OK with low vision/cane but not sure how extensively it can be enjoyed by totally blind cane users. OK with a seeing eye dog, I think. This bikeway certainly has a positive economic impact as well.

Links:
Walkway Over the Hudson <http://walkway.org/>
Minuteman Bikeway <http://www.minutemanbikeway.org/index.html>

T. Kurys wrote:
Sending this from Ken. Does anyone know people at Carroll Ctr. Who might have good input?

I, along with Jen, are members of the Natick Commission On Disability. We have been asked to provide ideas, suggestions and feedback on a proposed rail trail in the town, as well as Framingham and possibly Wayland.

I have only been on one rail trail that is in Bristol, RI that is used for walkers, bikers and skateboarders. My experience is quite limited.

Maybe you have used this type of pathway more often. Would you be so kind to email me kenchernack@gmail.com <mailto:kenchernack@gmail.com> during the next few days and tell me about your experiences, as well as suggestions and ideas for a good rail trail for handicapped individuals.

Thanks very much for your anticipated cooperation.

Regards.
Ken

James A. Sheridan
Chief of Department

Natick Fire Department

To: Martha White
Natick Town Administrator

From: James A. Sheridan
Natick Fire Department
Chief of Department

Re: Cochituate Rail Trail

Greetings,

The Natick Fire Department has several concerns related to the development of the Cochituate Rail Trail.

Access should be provided at each existing crossing.

Access will need to be constructed at intermediate points along the trail.

Access points constructed that transverse elevation should be ramps rather than steps and should incorporate turning radiuses that accommodate an ambulance stretcher and perhaps an off road rescue vehicle.

The trail should be marked so that people in crisis can have a reference point when calling for help.

Intermittent call boxes along the trail should be considered.

Lighting should be considered.

An off road rescue vehicle or bicycle with an attached gurney should be considered. This would be dependent on the width of the trail and available ambulance access points.

Respectfully Submitted,

James A. Sheridan
Natick Fire Department
Chief of Department

TO: Martha White, Town Administrator
FROM: Martin Kessel, Open Space Advisory Committee
DATE: October 30, 2009
SUBJECT: Cochituate Rail Trail Conceptual Design

The Open Space Advisory Committee has, for many years, supported the concept of the Cochituate Rail Trail from Natick Center to Saxonville. The 2002 Open Space and Recreation Plan included as a top-level goal: *"Provide a system of walking and bicycle trails that connect our open spaces and provide a way to travel throughout the town."* The Cochituate Rail Trail would fulfill all aspects of this goal, since it would connect open spaces at Cochituate State Park, as well as the Navy Yard and the end of Mechanic Street, and it would enable both walking and bicycle travel between Natick's two commercial centers – Natick Center and the Natick Collection. To fully meet these objectives, we feel that the Town should acquire, not just the railroad right-of-way itself, but also ancillary parcels, such as the parcel adjacent to the Navy Yard and the spur to the Natick Collection.

The 2002 Plan also included as the first action item under the overall goal of providing walking and bicycle trails: *"Secure public access to the Natick portion of the Cochituate Rail Trail."* We set a target date of 2003 – rather optimistically. We are currently updating the Open Space and Recreation Plan, and we believe the rail trail will continue to be a high priority. At our last Natick Days table, the most frequent question we were asked was the status of the rail trail, with many expressing frustration with the length of the process. From our experience, there is tremendous public support for this project.

We applaud the work undertaken by the Cochituate Rail Trail Advisory Committee, and stand ready to help in any way we can.

Draft input from Recreation and Parks Commission – memo will be provided

The Commission did discuss the CRT as John Griffith presented various aspects to the Board. He reminded the Board that there is a public review in late November with the Board and the public invited.

The Commission's responses at the meeting were in favor of a paved surface, which would help with more efficient travel between the Mall and downtown Natick. The connectivity of the state park and Navy Yard field was seen as a major plus! The getting on and off the trail at Navy Yard and the development of that parcel for public use was seen by the Commission as very important aspect of the overall project. The connectivity to the Framingham portion of their rail trail was also seen as advantageous.

Many of the Commissioners were in favor of the type of features that are presently on the Bedford-Arlington trail and Cape Cod Rail Trail.

Please feel free to call me if there are any other questions concerning the Board's input. Thanks, Dick Cugini

Appendix C – List of Acronyms

The following is a list of acronyms used throughout the Study:

AASHTO	American Association of State Highway and Transportation Officials
ACOE	Army Corps of Engineers
ADA	American with Disabilities Act
ADAAG	American with Disabilities Act Accessibility Guidelines
ADT	Average Daily Traffic
BLSF	Bordering Land Subject to Flooding (Floodplain)
BMPs	Best Management Practices
BWSC	Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup
BVW	Bordering Vegetative Wetland
CE	Categorical Exclusion Checklist
CERCLA	Comprehensive Environmental Compensation Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality Program
CMR	Code of Massachusetts Regulations
CVP	Certified Vernal Pool
CRT	Cochituate Rail Trail
CTPS	Central Transportation Planning Staff (Staff to Boston MPO)
CY	Cubic Yard
DCR	Massachusetts Department of Conservation & Recreation
DFW	Massachusetts Division of Fisheries & Wildlife
EA	Each
EH	Estimated Habitats for Rare Wildlife
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EOEA	Massachusetts Executive Office of Environmental Affairs
EOT	Commonwealth of Massachusetts Executive Office of Transportation
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FST	Fay, Spofford & Thorndike (Consultants)

List of Acronyms (cont'd):

FT	Foot
IVW	Isolated Vegetated Wetland
LEC	LEC Environmental Consultants, Inc. (Consultants)
LS	Lump Sum
LSP	Licensed Site Professional
LUW	Land Under Waterbodies and Waterways
MA	Massachusetts
MACRIS	Massachusetts Cultural Resource Information System
MA DEP	Massachusetts Department of Environmental Protection
MAPC	Metropolitan Area Planning Council
MassGIS	Massachusetts Geographic Information Systems
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
MGL	Massachusetts General Laws
MHC	Massachusetts Historical Commission
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer Systems
MUTCD	Manual on Uniform Traffic Control Devices
NEGEF	New England Grassroots Environment Fund
NEPA	National Environmental Policy Act
NHESP	Natural Heritage & Endangered Species Program
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
OHM	Oil or hazardous material
PH	Priority Habitat for Rare Species
PNF	Project Need Form
PVP	Potential Vernal Pool
RAO	Response Action Outcome Statement
REMOPS	Remedy Operation Status

List of Acronyms (cont'd):

RFA	Riverfront Area
ROW	Right-of-Way
RTC	Rails-to-Trails Conservancy
SAFETEA	Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003
SF	Square Foot
STB	Surface Transportation Board
SWPPP	Storm Water Pollution Prevention Plan
TE	Transportation Enhancement Program
USGS	United States Geological Survey
USFWS	United States Fish & Wildlife Service
WPA	Wetlands Protection Act

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